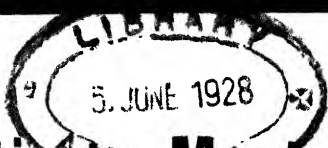




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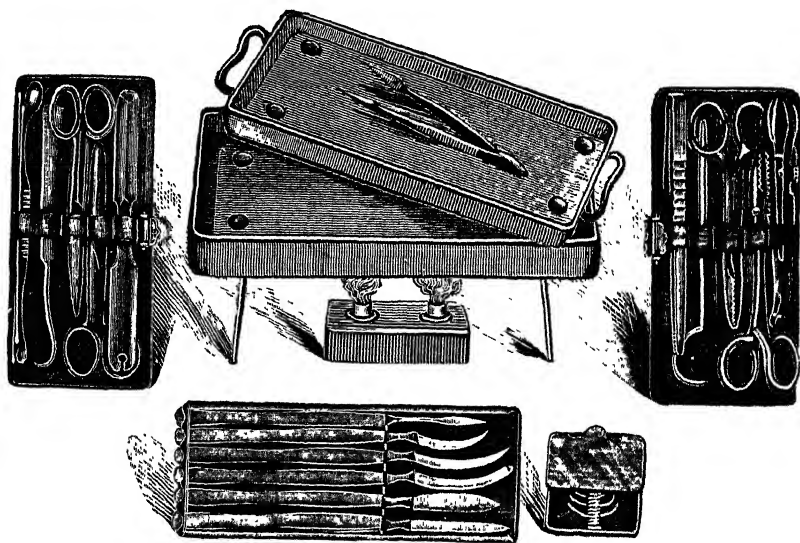
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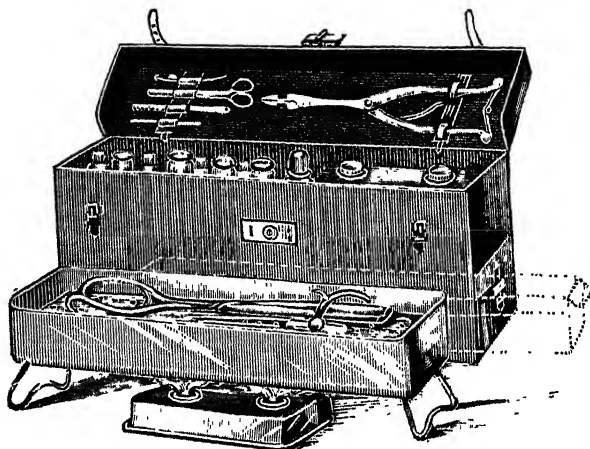
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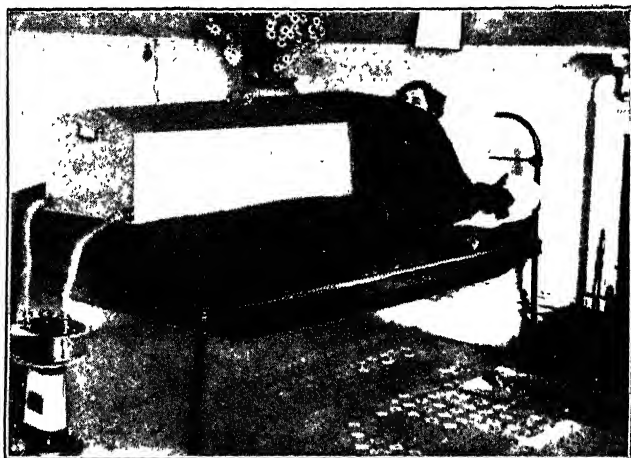
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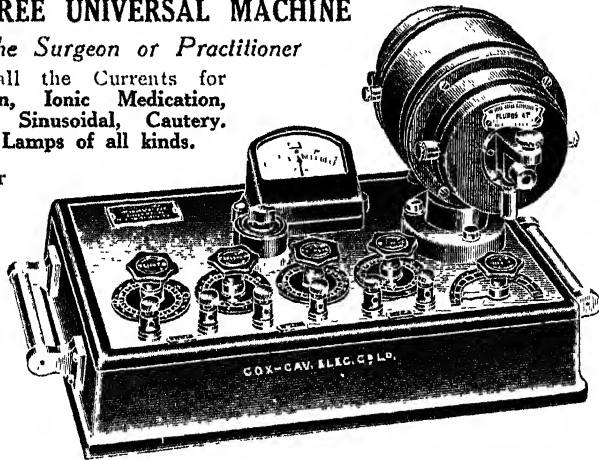
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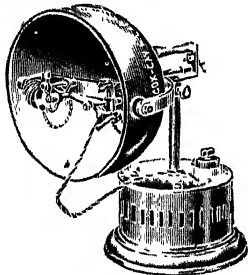


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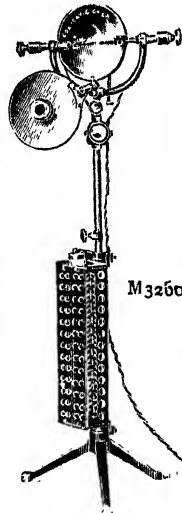
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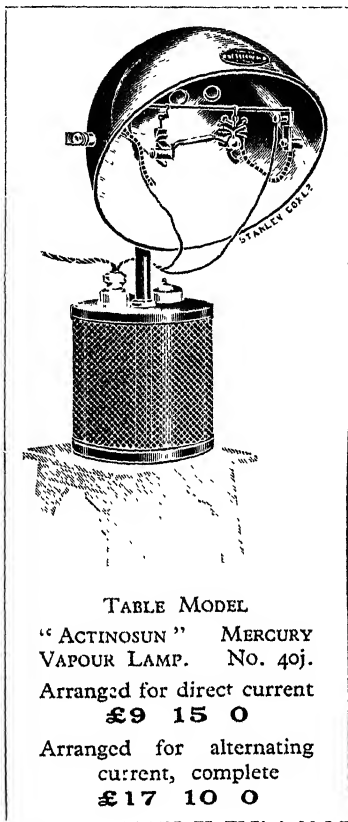
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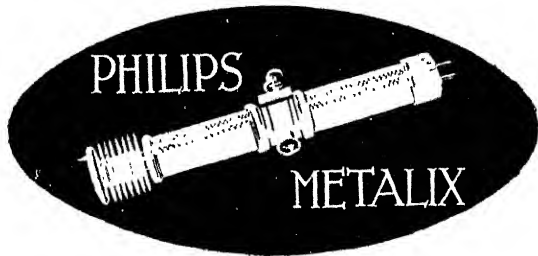
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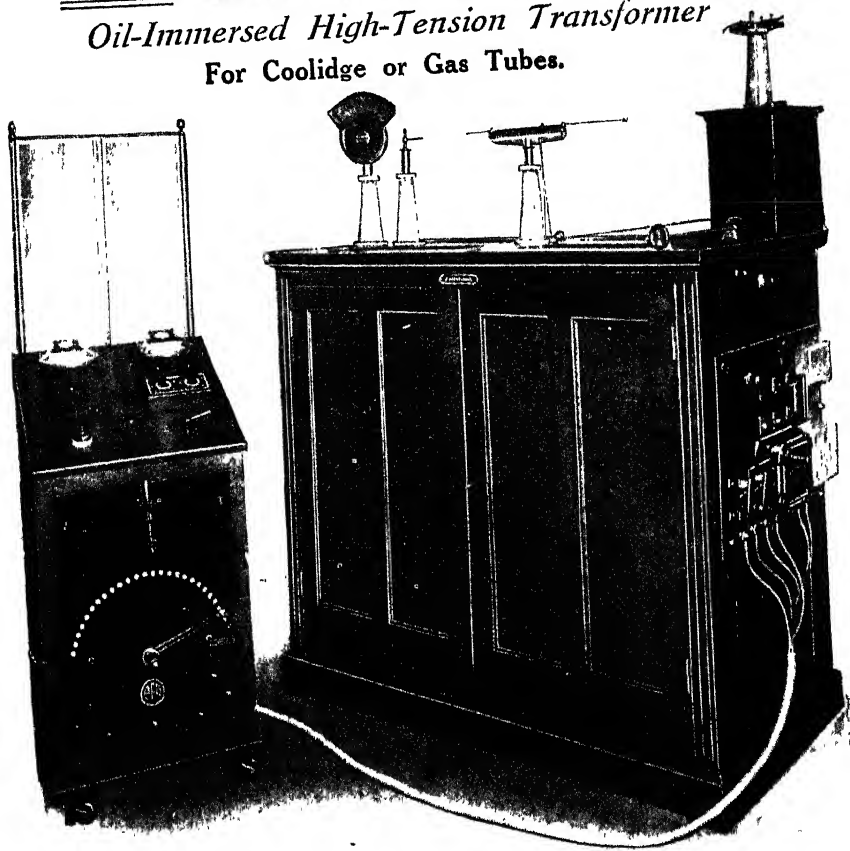
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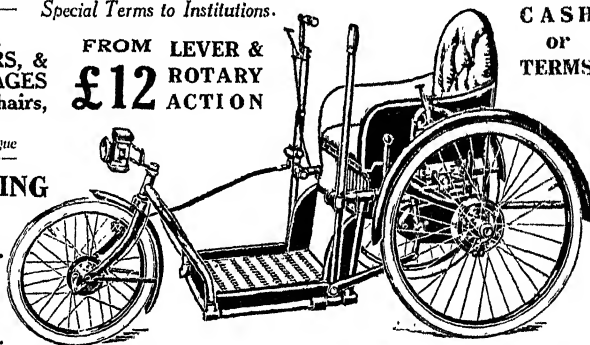
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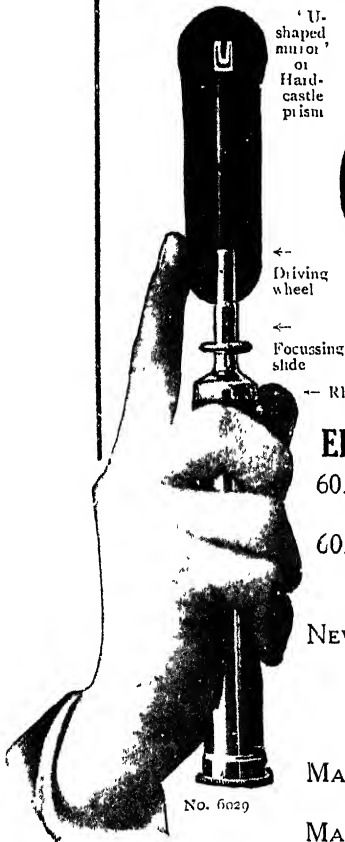
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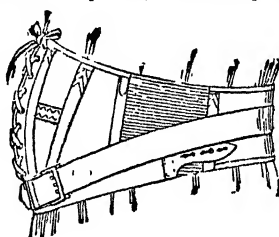
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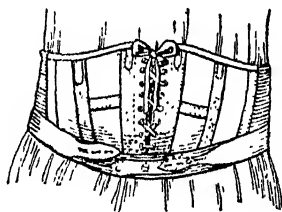
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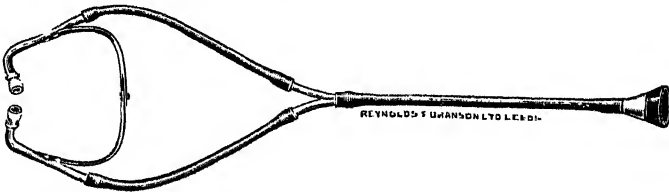
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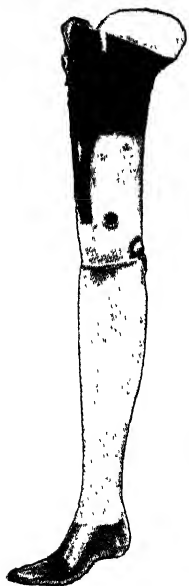
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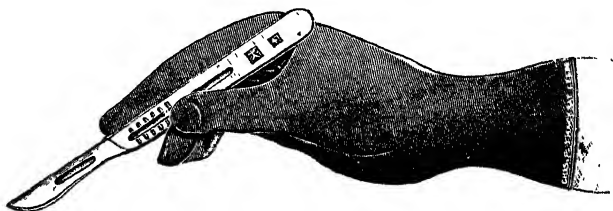
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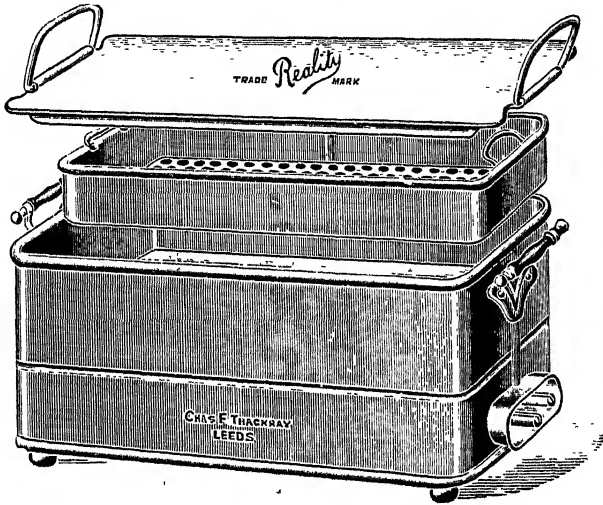
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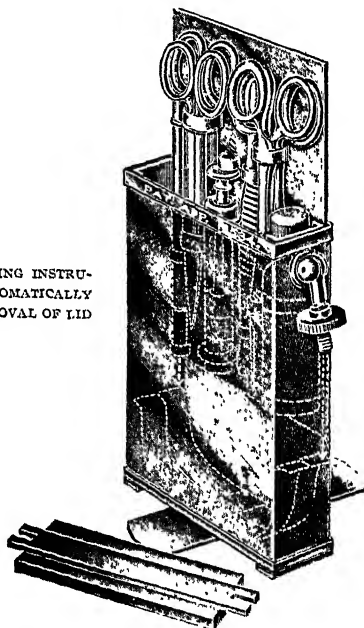
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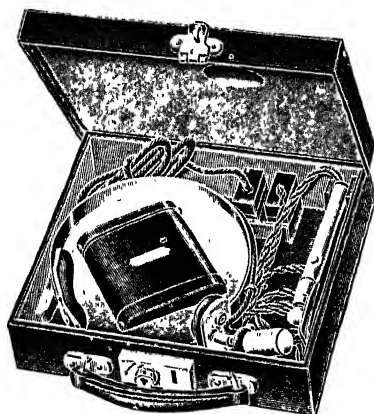
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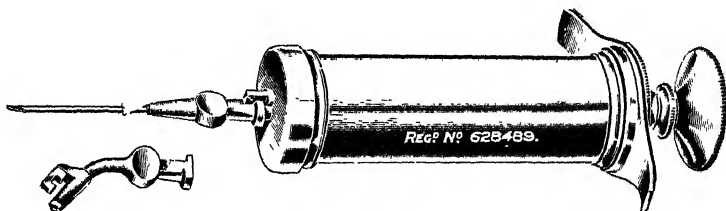
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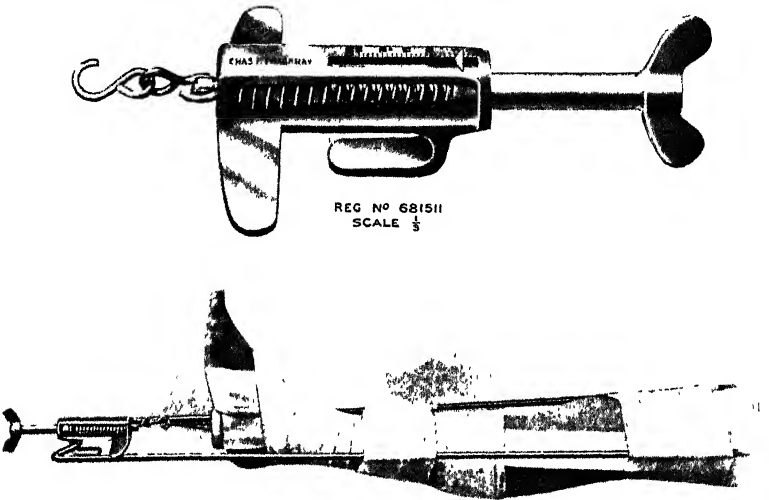
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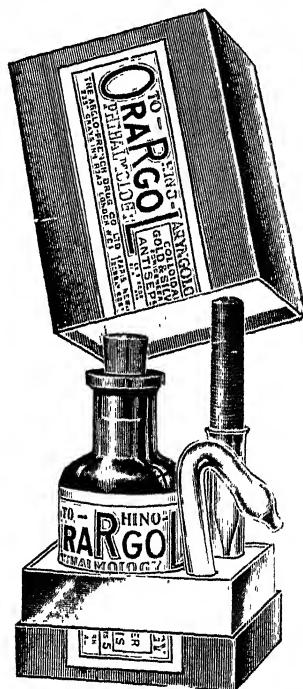
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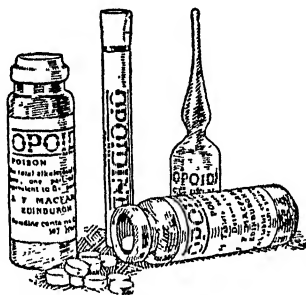
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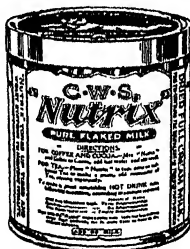


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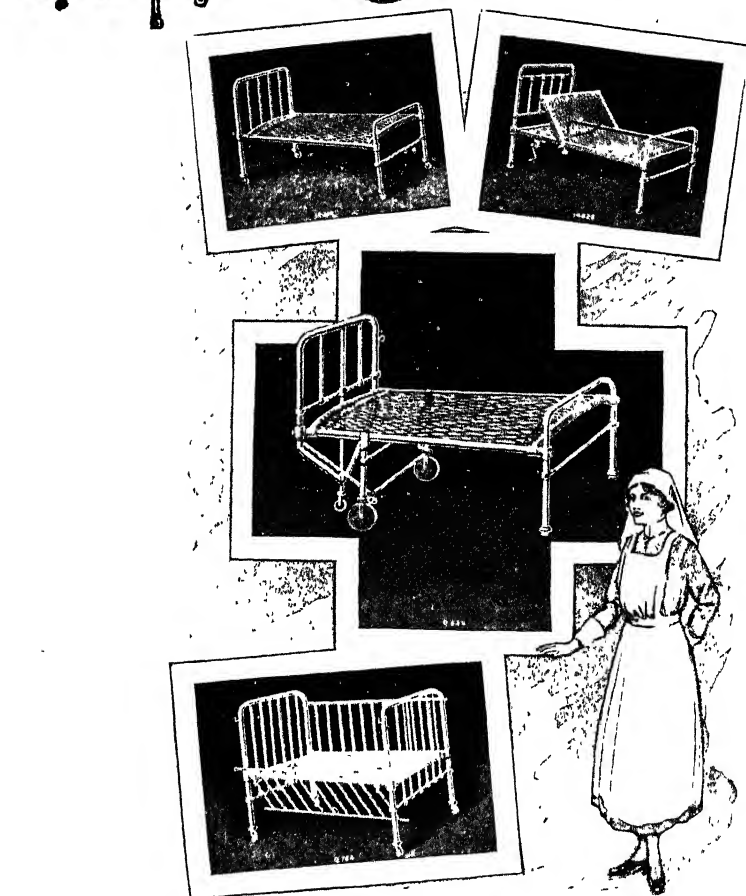
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THE present issue of the MEDICAL ANNUAL—46th year—does not differ materially from any of its more immediate predecessors. It is, however, believed that all the recent improvements have been more than fully maintained.

The Publishers tender special thanks to their Contributors this year, because—from circumstances beyond their control—the material for the various papers reached them later than usual, and it was only by their zealous efforts ungrudgingly given that final publication was not delayed.

THE PUBLISHERS.

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THE MEDICAL ANNUAL, 1928

A Review of the Year's Work in the Treatment of Disease.

INTRODUCTION

BY THE EDITORS.

IN these pages we try to give the reader some help in his search for what is both new and promising. This year there is an embarrassing wealth of such matter. The first place must be given to the liver treatment of pernicious anæmia, which is dealt with fully by two contributors, one of them enunciating the principles on which it is based, the other giving some useful details of its practical application. This seems likely to revolutionize our views not only of the prognosis but even of the pathogenesis of the disease. At the same time it opens up all sorts of therapeutic possibilities which will doubtless be reflected in future volumes of the ANNUAL. In this one, also, will be found a useful hint as to the treatment of aplastic anæmia by adrenalin. Apart from these examples there are no striking additions to the field of organo-therapeutics. The uses and limitations of insulin are discussed, and there is a valuable note on synthalin, an attempt to provide a synthetic substitute for insulin suitable for oral administration. It is evidently not going to displace insulin, but the mere fact that something should have already been achieved in this direction is encouraging. It will be interesting to see whether the liver treatment of pernicious anæmia is going to prove a real 'cure', or whether, like insulin, it has to be continued indefinitely.

Alcoholism is approached by two writers from different angles. The one contributes an interesting review of the tests for drunkenness, from which it appears that no infallible formula is forthcoming; the other, an account of narcosan, a remedy for alcoholism and drug addiction, consisting of a mixed extract of vegetable lipoids and vitamins which is said to have proved its worth. The value of antimony in the treatment of kala-azar is witnessed by some remarkable statistics of results obtained by the use of stibosan. Further progress in the treatment of leprosy by chaulmoogra oil and its derivatives is claimed. Vitamins, their origin and their place in therapeutics, are discussed in an interesting review. There is a summary of the malaria treatment of dementia

paralytica. It appears to be a needlessly complex application of the principle of protein shock, and the same is, of course, true of other artificially induced infections of the general paralytic patient.

The treatment of epilepsy is discussed, and we receive a salutary reminder that status epilepticus may be fatal, also that lumbar puncture is a valuable means of avoiding such catastrophes. It is deplorable that we have as yet no certain means of combating the virus of encephalitis lethargica, or repairing the damage which it leaves behind. We had hoped that the treatment by massive doses of hexamine, which has seemed to do good occasionally, might prove itself of general value. It is of interest to note that encephalitic complications are recorded in a number of relatively innocent infections—measles, mumps, and vaccinia—as well as in variola. Do these infections themselves attack the brain, or is it that they merely act as allies to the encephalitic virus? The question has an obvious practical bearing in its relation to the incidence of cerebral symptoms following vaccination.

Perhaps the most striking attempt at provision of a specific antidote to an infection selecting and injuring nervous tissue is that of a serum prepared at the Pasteur Institute in Paris for the treatment of acute poliomyelitis. Unfortunately it is only when the disease is epidemic that diagnosis can be made early enough to give this serum a fair chance.

Among the newer drugs discussed are cardiazol, novasurol, and ouabain. Each of these is destined to find its uses in the treatment of various phases of circulatory failure. The first has an action similar to that of camphor. It is therefore particularly indicated in general circulatory failure. The uses and limitations of the second are becoming more clearly defined, and it is now possible to give it by mouth. The last-named is a strophanthin, introduced several years ago, but recently submitted to fresh study. Phenylhydrazine, also, seems to be the best remedy for use in cases of erythraemia. There is an article on chilblains which gives much advice on treatment, but does not put forward any specific remedy. We know of one large general practice that pins its faith to small doses of opium for this complaint.

Preventive medicine has its place in this volume, in the form of articles on the reduction in infant mortality, the etiology of rheumatic infection in childhood, and isolation with quarantine in pneumonia. It is claimed for the last that adoption of this policy has sensibly reduced the rate of mortality from pneumonia in the city of Pittsburgh. The dangers to which our artificial methods of food-supply expose us are dealt with in a special article, which also outlines the administrative provisions for limiting those dangers. This completes a trilogy of articles, appearing in successive volumes of the ANNUAL, covering the whole field of food-supply, and emanating from an authoritative source. We are also glad to be able to offer to our readers an authoritative article regarding methods of dealing with epidemic disease in boarding

schools. Recent experiences have led us to believe that an article on this subject would be welcome to many practitioners, who are confronted by some of the most difficult problems in practice when infection breaks out in a school. We hope that the coloured plates illustrating the reactions to the Schick test for susceptibility to diphtheria, and to the Dick test of immunity against scarlet fever, will supplement the value of these articles.

A number of points likely to be of value in diagnosis are scattered up and down through the book. A review of the various tests of liver function that have been devised concludes that those most used are the lævulose tolerance, the bromsulphalein, and the icteric index; the best results are obtained by a combination of tests. These are for the most part so complicated as to preclude their application outside an institution. The same is true of cholecystography, which is fully discussed. Its value appears to be definitely established, and the risks have been largely eliminated. One very interesting diagnostic method turns on the fact that hairs infected with ringworm are fluorescent when exposed to certain rays, while normal hairs are not.

A good account of the non-tuberculous fibroses of the lung shows that there is plenty of room for the application of clinical common sense, as well as of more complicated methods, to the task of diagnosis. It is interesting, by the way, to be told how often hæmoptysis may occur in simple non-tuberculous bronchiectasis. There appears a somewhat destructive critique of the fractional test meal. In that rare disease, phlegmonous gastritis, we learn that the pain is relieved when the patient sits up.

In recent times striking progress has been made in the reduction of our conceptions of bone pathology to a logical basis. In this volume is a group of short paragraphs on 'late' rickets showing that, as in the rickets of infancy, the essential thing is interference with growth of bone. The causes of this vary, but the morbid process is the same.

Evidence as to the occurrence of a definite syndrome in cases of acute infarction of the wall of the heart continues to accumulate. Our reviewer, who has himself done much to increase our understanding of this matter, treats the subject in the same article as angina pectoris. He divides cardiac pain into five categories, giving a classification which affords a valuable working hypothesis on which to base treatment.

The year has been a good one in most of the branches of surgery. It seems probable that the toxic symptoms in appendicitis with peritonitis, and in intestinal obstruction, are due to absorption of the products of *B. welchii*, the bacillus of gas gangrene, from the bowel, and that they can be relieved by big doses of anti-gas-gangrene serum. Very favourable results are recorded in reducing the mortality from these affections.

In some American clinics considerable importance is attached to analyses of the blood for the CO_2 content in abdominal surgery. An alkalosis and an acidosis are both possible, each calling for appropriate treatment.

A detailed article will be found giving the modern indications for splenectomy.

At last a successful case is recorded of ligature of the abdominal aorta. A posterior approach is described to reduce the difficulties of tying the first part of the subclavian. In describing further cases of suture of wounds of the heart, surgeons lay stress on the vital factor of relieving cardiac compression by blood in the pericardium; a moribund patient may revive wonderfully when this is evacuated. The injection treatment for varicose veins seems to be taken up with great success and enthusiasm in many quarters now.

We are becoming more and more alive to the dangers to life of small infections of the face. This subject is considered at some length. There is also an article on the modern treatment of burns, mentioning favourably the tanning treatment and alcohol dressings.

A very good article appears maintaining that all that is needed as a rule to cure cases of pressure on the brachial plexus from cervical rib is to divide the scalenus anticus muscle.

We have introduced a new section on surgical diseases of children. A remarkable series of intussusceptions in children treated by inflation without operation is published, the results being perhaps the best yet recorded for any method of treatment. Some startling claims have lately been made in South America for the quick cure of tuberculous bone disease; these are discussed. There is a tendency to perform Albee's fixation operation for tuberculous spine at an earlier age.

Coming to affections of the rectum, a new form of prolapse is described in which the colon falls into the rectum but does not protrude externally; it is to be treated by colopecty. It is shown that in favourable cases operation for cancer of the rectum may show a mortality of only 3 per cent, and a cure-rate (five years) of 50 per cent. Good results are quoted after burying radium in and around inoperable cancers.

Surgery of the central nervous system is profiting by the enthusiasm of a small company of earnest workers, and in our opinion it is a branch of surgery that is pre-eminently suitable for localization in a few hands. The best results in cases of cerebral abscess are got by simple tapping; drainage tubes do harm by spreading the infection. Tumours of the brain are often best removed piecemeal or by suction. Tuberculoma, which used to be described as common, is really rare.

The general practitioner should be interested in an article on the treatment of sprains and synovitis. The new operations for difficult

cases of congenital dislocation of the hip are described, perhaps the most promising being to reduce the dislocation and retain the femoral head by a suture passed through the floor of the acetabulum; the hip-joint capsule is not opened. It is now maintained that there is no true primary central sarcoma of bone, apart from giant-celled myeloid growths.

In the section on genito-urinary surgery a description will be found of the best method for operating for extroversion of the bladder by transplantation of the ureters into the colon, and an account of a technique for hypospadias. There are many papers on total removal of the bladder for extensive cancer, but our reviewer is unconvinced that the results are good enough; radium, X-ray therapy, and diathermy are discussed. A study of a large series of cases of malignant prostate leads to the conclusion that when the diagnosis is obvious clinically it is not worth while to remove the prostate, and, as radium is rather disappointing, the best help one can give the patient is to drain the bladder suprapubically when micturition becomes difficult. When stones are present in both kidneys, one with small stones and the other with large, it is better to remove the small stones and to leave the big ones. Stones no larger than a pea should also be left to pass.

Turning now to the section on venereal diseases, a very hopeful method of treating gonorrhœa is described, depending on the intra-urethral injection of a toxin-free product of the gonococcus, together with subcutaneous inoculation with the same. Another new method is to irrigate with mercurochrome and glucose. We think our readers will be glad of the brief summary given by the reviewer of the best line to be followed at the present time in the treatment of an ordinary case, both of gonorrhœa and of syphilis. Evidence is adduced to show that reinfection may occur in syphilis, and that this event does not prove that the original infection has been cured.

In ophthalmology, perhaps the outstanding discovery is that an organism can be isolated in cases of trachoma which will induce the disease in monkeys and chimpanzees. Evidence is put forward to show that spring catarrh of the conjunctiva is due to foreign proteins. An interesting and authoritative pronouncement is given on the question as to whether the cinema is injurious to the eyes, the general sense being that it is not. Some curious cases of sudden blindness in pregnancy are described.

Spasm of the œsophagus is best treated with the mercury bougie, details of which method are given. In an article on retropharyngeal abscess, emphasis is laid on the advice that the septic abscess must be opened through the mouth, and without an anæsthetic. Tuberculous collections must be attacked through the neck. A new Eustachian catheter is now being used which is passed right up the tube, apparently with excellent results.

Amongst much of interest in the section dealing with obstetrics and gynaecology we may mention the following. A good deal can be done to prevent genital prolapse after a pregnancy by teaching the patient to contract the levator ani during the puerperium. Much work has been done lately on the subject of sterility, which is reviewed rather fully; amongst other things reference is made to the new vitamin E, present in wheat, peas, and lettuce, which aids conception in animals. Further contributions to the controversy between surgery and radium in cases of cancer of the cervix are discussed; one surgeon finds 70 per cent cases operable, the mortality 19 per cent, and the cure rate 34 per cent. At a Stockholm clinic 20 per cent cases are claimed as cured by radium. The care of the pregnant woman is attracting much attention nowadays, and there is a discussion of it. Habitual abortion may be treated by calcium salts, the new vitamin E, ovarian extract, and abstinence from coitus. The vomiting of pregnancy brings about dehydration, and intravenous injections of glucose are advised. Our knowledge of the function of ovulation has increased lately, and a summary of the new information is given.

In the section on anæsthetics the occurrence is mentioned of convulsions under ether, which may be fatal. The explanation is obscure. A minor trouble is hiccup, which may often be checked by flexing the head forcibly on the chest. Collapse under an anæsthetic can be treated, often with success, by an intracardiac injection of adrenalin. Further cases are recorded of persistent paralysis after intraspinal anæsthesia. In Central Europe, tutocain is greatly used now in preference to novocain. We appear to have an efficient antidote to cocaine poisoning in barbitol.

The present position of treatment by radium is dealt with in a special article. Outstanding points are that it is not wise to use radium in diabetics, nor when the tissues are inflamed. Sarcoma of bone, so hopeless with other methods of treatment, will not infrequently respond quite well to radium.

* * * * *

Summarizing, we may claim that this is a year which will be remembered for its substantial advances in many directions. These are of a kind that should be particularly encouraging to clinical workers. Too often the word 'research' is treated as if it were the label of some exalted virtue that belonged exclusively to demigods working in laboratories. This is quite erroneous. The spirit of research in medicine is found in its purest and most productive form wherever those who are responsible for the care of the sick strive with all their might to find means of preventing, curing, or at least relieving the misery caused by disease; and it is to clinical workers, animated by this spirit, that we owe nearly all the progress chronicled in this volume.

DICTIONARY OF PRACTICAL MEDICINE

BY MANY CONTRIBUTORS.

ABDOMINAL SURGERY, MISCELLANEOUS.

A. Rendle Short, M.D., F.R.C.S.

Contra-indications to Surgery in Acute Abdominal Affections.—It is obviously safer, when a patient has recently had an acute attack of appendicitis, cholecystitis, or other intra-abdominal infection, to wait until the inflammatory process has subsided before interfering with it, but it is not easy to be sure when the period of calm has arrived. Many surgeons hold their hand for a fortnight, following upon some investigations made long ago by Lockwood; but this is often too long, and sometimes not long enough. De Martel¹ believes that the best guidance is given by the differential leucocyte count. He has never had trouble when the polynuclear count was normal, but on several occasions operating with a raised polynuclear count has been followed by violent reaction even when the temperature had been normal for weeks.

Abdominal Adhesions.—This subject was somewhat fully considered in the MEDICAL ANNUAL for 1927. It may be added that Coffey² recommends, in those difficult cases where the intestines are extensively adherent to the pelvic peritoneum, and attempts to liberate them have been followed by recurrence with continual pain and dragging sensations, that after freeing the adhesions, a large sheet of rubber should be wrapped around the pelvic viscera to separate them from the pelvic wall. This is left a fortnight, and then removed. In his experience there is no further recurrence of the painful symptoms.

Unexpected Swellings in the Abdomen.—Koster³ describes two personal cases, and refers to others from the literature, of *acute omento-volvulus*. This affects males about the fifth decade, as a rule. Many of them, but not all, have a hernia. The patient is suddenly seized with severe pain, usually in the right hypochondrium, with a rise of pulse and temperature. There may be vomiting. A tender mass can be felt running down from the right costal margin to the umbilicus. If the patient has a right inguinal hernia the swelling may be in the appendix region. At operation a mass of twisted and dusky omentum is found. The treatment is to remove it. A curious case is described by Béard and Dunet,⁴ of a mass in the right iliac fossa, in a lad of 18, which was thought to be sarcoma of the pelvis. On exploration it proved to be a *hamatoma*, and the patient gave a convincing history of hereditary hæmophilia. The interference started the bleeding again, and the patient all but died of it, but was finally saved by *Gauze-plugging* and the intravenous injection of *Citrates*.

Parietal Pain Simulating Visceral Disease.—E. Moschowitz⁵ points out that an erroneous diagnosis of visceral disease may be made when the real trouble lies in the parietes. The conditions specially to be borne in mind are arthritis of the costochondral junctions, neuritis of the intercostal nerves, 'slipping rib', epigastric fatty hernia, and muscular strain. The first is recognized by the fact that pain definitely and constantly follows some particular movements, such as sneezing or coughing; there is tenderness over the articulation, and the trouble is very persistent. Neuritis of the nerves, apart from herpes zoster, is rare. Slipping rib is common and important; it usually occurs where the

ninth or tenth costal cartilages join the next above. It is readily discovered if looked for, but some people with slipping rib do not complain of pain. The pain is associated with some definite movement. Epigastric fatty hernia is to be found in the mid-line above the umbilicus, and may be the cause of all sorts of vague dyspeptic symptoms. Muscular strain of the abdominal wall may cause tenderness and aching, often in the region of the appendix. Our experience completely bears out this author's conclusions.

End-results of Abdominal Suture Methods.—W. A. Jackman has communicated to us a study of 174 cases of abdominal incisions, all inspected at least a year, and in all but a very few at least two years, after operation, with a view to finding the best methods of closure. The report has not been published. The figures form part of a combined research at the Bristol Royal Infirmary.

REGION	METHOD	CASES	HERNIAS	PER CENT
Upper abdomen (paramedian)	Through-and-through	23	4	17.4
Ditto	Layers	49	3	6.1
Transverse .. .. .	.. .. .	23	2	8.7
Lower abdomen (midline or paramedian)	Layers	64	5	7.8
Ditto	Through-and-through	15	6	40.0
Totals		174	20	11.5

In addition to the 20 hernias recorded, it was noted that the scar was 'weak' in 13 cases: 3 above the umbilicus, and 10 below. Of these, 8 were sewn

in layers, and 5 through-and-through. It is generally supposed that infection of the wound is a very important factor in producing hernia, but in this series there were 35 infected wounds, of which only 8, or 22.8 per cent, had hernia.

Abdominal Suture in Drainage Cases.—It is well known that there is special liability for hernia to follow abdominal operations where the wound has to be drained. It is, of course, an immense safeguard to use a stab-drain in these cases for the rubber tube or whatever may be preferred. This is not always possible, and then the 'twin mattress suture' technique used by F. Reder⁶ may be suitable (*Figs. 1, 2*). The material used is silkworm gut. For the posterior rectus sheath iron-dyed silkworm gut is employed, on account of its black colour.

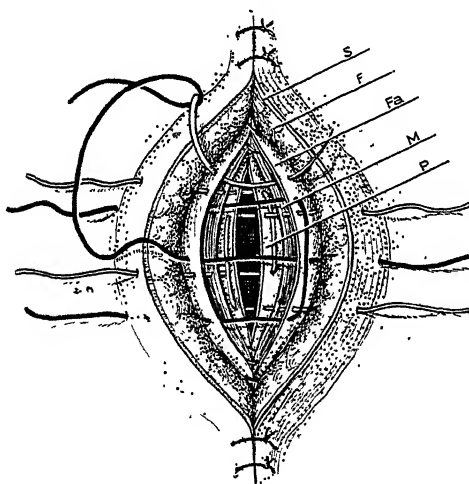


Fig. 1.—Reder's 'twin mattress suture' for abdominal closure in cases of drainage. Introduction of the sutures. S, Skin; F, Fat; Fa, Fascia; M, Muscle; P, Peritoneum.

(*Figs. 1 and 2 re-drawn from 'Annals of Surgery'.*)

For the anterior rectus sheath the undyed silkworm gut is employed. It is necessary to use suture material of a different colour to simplify the identification of the fascial structures carrying the different sutures. The suture is

introduced through the skin about three-quarters of an inch from the wound margin. It passes through the anatomical structures and penetrates the posterior rectus sheath, including the peritoneum an eighth of an inch from its edge. The suture is then carried across the wound and engages the opposite posterior rectus sheath, piercing it and the peritoneum from within out, and about an eighth of an inch from the aponeurotic margin. This suture incorporates about half an inch of the body of the posterior rectus sheath, and piercing it from without in, it is again carried across the wound to the opposite posterior sheath, which it penetrates, including the peritoneum, from within out, about an eighth of an inch from its margin. It then pierces the anatomical structures in its path as it emerges on a line a half-inch below the point of entry. The opposing suture is placed in a similar manner. In introducing the opposing suture an interval of an eighth of an inch should be allowed for tissue play. The technique for placing the sutures in the anterior rectus sheath is similar to that of the posterior sheath. In this region the only structure interposing between skin and aponeurosis is fat. In a wound three inches long, which can be considered a large drainage wound, three 'twin mattress sutures' will answer the purpose. After the sutures are in place the strands stretching across the wound are pulled aside to facilitate the introduction of the drain. The ends of the sutures are properly cared for so that they can be readily assembled and tied over a small roll of gauze after the drain has been removed. No haste should be made in removing the 'twin mattress sutures', and nothing less than two weeks after the removal of the drain should be considered.

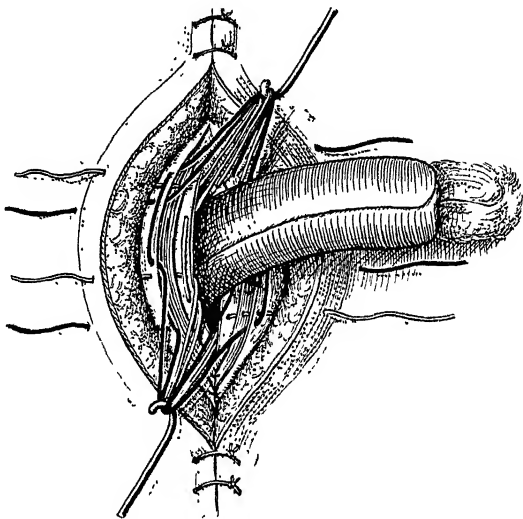


Fig. 2.—The twin mattress sutures are in place, and the silk-worm-gut strands bridging the wound are held apart for the introduction of the drain. After the removal of the drain, traction in opposite directions upon the respective sutures will close the wound with good apposition of the corresponding structures. The sutures are secured individually and tied over a small roll of gauze.

REFERENCES.—¹*Bull. et Mém. Soc. nat. de Chir.* 1926, lii, 237; ²*Ann. of Surg.* 1927, June, 808; ³*Amer. Jour. Med. Sci.* 1926, Aug. 230; ⁴*Lyon chir.* 1926, xxiii, 622; ⁵*Jour. Amer. Med. Assoc.* 1927, March, 897; ⁶*Ann. of Surg.* 1927, March, 100.

ABDOMINAL TUBERCULOSIS IN CHILDREN. (See TUBERCULOSIS.)

ABSCESS OF BRAIN. (See BRAIN, ABSCESS OF.)

ABSCESS OF LIVER. (See LIVER, SURGERY OF.)

ABSCESS, PERITONSILLAR. (See TONSILS, DISEASES OF.)

ABSCCESS OF SPLEEN. (*See SPLENECTOMY.*)

ABSCCESS, SUBPHRENIC. (*See SUBPHRENIC ABSCCESS.*)

ACHYLIA AND ACHLORHYDRIA. (*See also* **PERNICIOUS ANÆMIA.**)

Robert Hutchison, M.D., F.R.C.P.

These terms are often used very loosely, but by achylia *should* be meant absence, or practical absence, of *all* gastric secretion, both acid and pepsin, whilst the term achlorhydia should be used only for absence of *free* hydrochloric acid. Walter Zweig¹ uses the term achylia in its proper sense, and distinguishes three varieties: (1) The simple form in which there is no histological change in the stomach, and which is due either to a constitutional inability on the part of the stomach to secrete, or to nervous influences; (2) Achylia the result of an atrophic gastritis; (3) Achylia associated with carcinoma, which is due not only to a gastritis but also to a toxic action of the cancer on the secreting mechanism. He emphasizes again the fact that achylia may produce no symptoms, or show itself only by chronic diarrhœa. In other cases, however, the patient may complain of weight, fullness, and other symptoms of dyspepsia, or even of sharp pains resembling those of ulcer. Heartburn also may be met with from the presence of organic acids. In treatment he recommends small and frequent meals of finely divided food, but only gives **Hydrochloric Acid** in small doses (10 drops with meals), as it acts chiefly as an excitant of the gastric and pancreatic secretion and small doses are sufficient for this purpose.

Knud Faber² is strongly of opinion that all cases of achylia are the result of gastritis, meaning by that an inflammation of the glandular parenchyma. He has found no evidence of the existence of a constitutional form in his observations on the gastric contents of young children. He states, moreover, that achylia is an 'extremely common' disease, and this is so opposed to the experience of others as to raise the suspicion that many of his cases would have been more accurately described as examples of achlorhydia. As regards the latter condition, W. F. Cheney³ says that when it is detected one should think first of pernicious anæmia. He does not, however, share the belief, which has lately become popular, that the absence of acid in pernicious anæmia is primary and inborn, that it allows the passage into the bowel of hæmolytic streptococci, but regards the achlorhydia (it is really an achylia) as the result of the action on the gastric cells of the poison, whatever it be, of the disease. From this point of view the achylia is merely a symptom like the anæmia or changes in the cord, though it may precede these by a long time. In gastric carcinoma achlorhydia has no more diagnostic value than a palpable tumour, i.e., it is a late sign. The other conditions commonly associated with absence of free acid are chronic gastritis and chronic disease of the gall-bladder. In the latter condition diminution of secretion or even complete achlorhydia is a frequent but by no means constant occurrence. It probably results from a co-existing gastritis. Finally, achlorhydia may also be met with as a result of functional nervous disturbance.

REFERENCES.—¹*Wien. klin. Woch.* 1926, June, 726; ²*Amer. Jour. Med. Sci.* 1926, July, 1; ³*Jour. Amer. Med. Assoc.* 1926, July, 22.

ACNE VULGARIS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

E. H. Molesworth¹ lays great stress on **Massage** of the face in acne vulgaris; the massage is of the pinching variety and is carried out by the patient himself. The patient is told to wash the face in very hot water and lather with plain toilet soap; then to steep the face in the water until it is flushed and hot.

The face is then squeezed or pinched between the fingers steadily all over the affected areas, and is scrubbed over with a swab saturated with equal parts of ether and spirit to remove the grease expressed from the glands. The author considers this constant mechanical emptying of the sebaceous follicles, carried out systematically day by day, of more value than any local antiseptic treatment. He uses, however, in addition, an application of 1-1000 perchloride of mercury in spirit after the massage. All greasy preparations are to be avoided, but powders may be used.

REFERENCE.—¹*Med. Jour. of Australia*, 1926, July 3, 10.

ADENOIDITIS, ACUTE. (See TONSILS, DISEASES OF.)

ADENOMA, TOXIC. (See GOITRE, EXOPHTHALMIC.)

ALBUMINURIA, FUNCTIONAL. *Hugh MacLean, M.D., D.Sc., F.R.C.P.*

The question of the significance of albuminuria still receives a good deal of attention. It is now generally accepted that albuminuria *per se* does not necessarily indicate any renal lesion in the ordinary sense of the term, but that all patients showing this feature should be subjected to a careful examination with a view to determining its significance. Norman¹ examined the urines of 1787 boys between the ages of 7 and 15 and obtained the following results: Albumin was found in 10 per cent of the 7-year-old boys, in 19 per cent of the 8-year-old, in 19 per cent of the 9-year-old, in 22·7 per cent of the 10-year-old, in 24 per cent of the 11-year-old, in 22·6 per cent of the 12-year-old, in 28·5 per cent of the 13-year-old, in 33·7 per cent of the 14-year-old, and in 40 per cent of the 15-year-old. It is noteworthy that from 9 years upwards there is a steady increase in the percentage of albuminurics with the exception of the 12-year-old group, which shows a fall of 1·4 per cent compared with the preceding age group. These figures are interesting as showing how common albuminuria is even in the first decennium of life. It has often been noticed in older schoolboys between the ages of 15 and 30, but there are few observations on children under 15. H. H. Bashford² came to the conclusions that about 1 in every 20 young male adolescents will be found to have albuminuria, and that in a considerable number of instances the condition persists for many years, if not throughout life; that its presence is consistent with the prospects of a perfectly normal life of physical efficiency; that in the great majority of cases the 'after-rest specimen' is usually free from albumin; that the condition is not definitely associated with any particular type of youth or man with a so-called 'nervous' disposition, nor with lordosis, oxaluria, or a history of scarlet fever. According to Weise,³ functional albuminuria in the young very often yields to suitable gymnastic exercises. Out of a total of 49 children, successful results are claimed in 44, which gives a total of 89·8 per cent. Further results of this treatment will be watched with interest. On the whole, however, the condition does no harm, and in the absence of obvious bodily defect no treatment is necessary.

REFERENCES.—¹*Clinical Jour.* 1926, July, 330, ²*Lancet*, 1926, 11, 5391; ³*Munch. med. Woch.* 1926, 1275.

ALCOHOL AND DRUG ADDICTION. (See also DRUNKENNESS, TESTS FOR.)

Henry Devine, M.D., F.R.C.P.

Improved Belladonna-Hyoscine Treatment.—Laughton Scott¹ describes an improved method for withdrawing drugs of addiction without discomfort to the patient. No one, he observes, who has become addicted to the habitual use of drugs ever offers himself for treatment without the firm conviction that withdrawal will strain his powers of endurance to the uttermost. Whether

the process be very gradual, whether it be covered by the use of other drugs, or whether it be sudden and ruthless, great suffering is held to be inevitable; so that the various treatments are reputed to differ very little except in so far as some spread the misery over a period, while others concentrate it into a few days of intolerable agony. The writer considers that the technique associated with the name of Lambert offers the easiest passage to the victims of morphia and other drugs. The Lambert method affords a perfectly safe means of producing a mild belladonna-hyoscyne poisoning which covers a progressive diminution in the habit-forming drug. Very free purgation is secured through the treatment, which is continued without intermission for three or four days. A 'special mixture' which contains equal parts of the tincture of *Belladonna* and the fluid extracts of *Hyoscyamus* and *Xanthoxylum* (the pharmacological properties of which latter drug appear to be doubtful) is administered in increasing doses.

Scott has found that this treatment is rapid and certainly modifies pain; but recovered patients never, in his experience, speak of the treatment as even approximately free from unpleasantness. Recognizing this, he has devised a modified use of the Lambert method which renders the patient not only free from actual pain, but also in the majority of cases free from a single hour of uneasiness. This treatment consists essentially in a far more gradual and cautious withdrawal of morphia (or other drug), covered by two successive waves, as it were, of over-dosage of the 'special mixture' and Luminal respectively. It is spread over a period of from ten to fourteen days. The reduction of morphia takes place *pari passu* with these two processes and is timed to be completed when the maximum of luminal is nearly reached. Delirium is not produced, a slight and transient confusion only being aimed at.

Most careful gradation of the morphia is necessary, and the nurse has instructions to have ready small supplementary doses in case the patient shows any signs of uneasiness. If he is comfortable, for instance, at 2 gr. in twenty-four hours, he is left at that for two days, then reduced to $1\frac{1}{2}$ gr. for a similar period. When the total dose is $\frac{1}{2}$ gr. in twenty-four hours without discomfort for two days, saline is given in place of the drug. By this time the patient should have passed through slight belladonna-hyoscyne confusion into the somnolence of luminal. At no stage should any distress be felt; there is nothing in the nature of a 'crisis'; and it only remains to inform the patient three days afterwards that he is morphia-free. Insomnia is rarely troublesome, and a proportion of patients regain normal sleep very rapidly. Treatment is discontinued at night. During the day a special nurse should always be within call; but the patients require no special invigilation, and one nurse can do duty for several. The writer points out that he does not suggest that the eventual prognosis is affected by the painlessness or otherwise of the withdrawal. Much more essential in this connection is the after-treatment, which should be directed to rebuilding the patient both physically and mentally.

Treatment by Narcosan.—A. Lambert and F. Tilney² record their investigations in regard to the use of a drug named narcosan in the treatment of drug addicts. Narcosan is a substance made by A. Horovitz, a biochemist. The substance had been used successfully for narcotic addiction, and had been the subject of considerable controversy, but with no comprehensive test under proper conditions to settle its value. Eventually it was patented by the assent of Mr. Horovitz, through which act its composition became known. Narcosan is a solution of lipoids, together with non-specific proteins and water-soluble vitamins. The lipoids are obtained from soy beans and cotton seeds, by extraction with hot alcohol; the vitamins from plant seeds by percolation with saline solutions; the non-specific proteins from alfalfa seeds, or Hungarian

millet, by extraction with highly diluted hydrochloric acid. Equal parts of these three solutions are mixed together to form narcosan. The proteins extracted by acid are used instead of those obtained by alkalis, as the acid proteins are non-toxic, while some of the alkaline proteins are highly toxic. The hot alcohol extracts both fats and lipoids, the fats being separated from the lipoids by a process of saponification.

The theory of the action of narcosan in the body is that narcotics, such as morphine, call forth in the organism certain protective substances to neutralize them. If the narcotics be suddenly withdrawn, these neutralizing substances are themselves toxic to the body. The lipoids in narcosan neutralize these toxic substances in place of the narcotic. After seventy-two hours, because the withdrawal symptoms are over, these neutralizing reactions have ceased; the lipoids are then continued to replace the depleted lipoids in the body. The non-specific proteins of the narcosan solution are added to stimulate the blood-forming tissues. This is a theory which scientific investigations must prove or disprove.

A trial of the narcosan treatment was made by Lambert and Tilney in the Correction Hospital on Welfare Island. The authorities were extremely anxious to find some form of treatment which would replace the so-called 'cold turkey' method, or ordinary withdrawal method, practised in the penal institutions in New York. Some 219 men and 147 women addicts were given the narcosan treatment. The type of patients were those found in the penal institutions of a large city, the petty offenders for small crimes, who were addicted to the use of heroin and morphine, or those self-committed who had been sent by the courts to rid themselves of their addiction. Most of them have drifted into drugs through the temptation of their environment.

Details of the Treatment.—On admission they were given a capsule composed of :

B. Hydrarg. Chlor. Mit.	gr. j	grm. 0.06	Capsic.	gr. ss	grm. 0.03
Ext. Colocyath.	gr. ij	grm. 0.18	Pulv. Zingib.		
Ext. Euonymin.	gr. ss	grm. 0.06	Strych. Sulph.	ãã gr. ãã	grm. 0.001
Res. Podoph.	gr. ss	grm. 0.03			

This was followed three or four hours later by a dose of Epsom salts; as soon as their bowels acted they were given 1 c.c. of narcosan hypodermically. This was administered intramuscularly, in the muscles of the upper arm, or in the shoulder at the back of the arm. These narcosan hypodermics are given thus every four hours for the first twenty-four hours, then every six hours for three days and nights, then every twelve hours for three days, and then once a day for about ten days, or until the patient has had about forty injections. No injections of morphine or heroin must be given: if this should be done, intense distress, nausea and vomiting, headache, and a sense of benumbing collapse are produced; in fact, the administration of morphine or heroin can produce a serious collapse. If the patients succeed in smuggling in narcotics and take them, these symptoms are soon evident. The narcosan treatment is self-protective against the patient indulging on the sly in narcotics. If patients are nervously collapsed from the sudden withdrawal of their narcotic before treatment begins, they should be given narcosan immediately to quiet them, especially the women, who are more likely to become wildly hysterical under these circumstances. This quiets them, and then they should have their cathartics.

For the first twelve hours the patient becomes nervous and restless, he feels weak, and is likely to be troubled with twitching of his muscles, pain in the back, and headache, and often pain in the legs. As the narcosan is given to him he becomes less nervous; if the patient is excessively nervous an extra

dose of narcosan can be given him at the two-hour interval. The majority of the patients do not sleep much the first night; but not a few get short naps, or, among some of the heroin-takers, they obtain a little sleep. Some go through the entire treatment with hardly any uncomfortable symptoms.

In the next twelve hours the twitching and the nervousness continue, and patients are apt to have nausea and vomiting, and some have abdominal cramps and diarrhœa. Some of these patients will have simply the nausea and vomiting, others will have only the diarrhœa. When their diarrhœa becomes excessive there is a diminution in the amount of urine passed. If the diarrhœa is not excessive they begin frequently to show a diuretic effect, and pass an increased amount of urine. Many of them feel cold and are with difficulty kept warm; others sweat abundantly. On the second and third nights they begin to sleep at short intervals, or obtain two to four hours' sleep. After the second night the majority of patients say that they feel much better. Often, when vomiting other substances, these patients can retain fruit-juices, such as of lemons and oranges; this relieves the dryness of their mouths and makes them more comfortable. Among those who show a severe reaction are especially those with morphine addiction of long standing; these patients are likely to have severe abdominal cramps, and their pulse becomes frequent and even feeble. In other patients the pulse becomes infrequent, dropping down below 50, but these do not have as much discomfort as those with rapid pulses. Those with slow pulses, however, do not seem to have as quick a reaction towards convalescence and recovery as those with frequent pulse-rates. By the third night the patients are beginning to sleep better, and the symptoms are abating even in those who previously seemed severely ill.

They soon improve, and in the great majority of instances on the fourth day become comfortable. They acknowledge their physical craving for narcotics has ceased. By the fifth day their appetite begins to return, and they sleep more both in the daytime and at night; soon their appetites become excessive, and they are continuously eager for food, especially sugar. The older patients, and those long addicted to morphine, convalesce more slowly, and complain of weakness, although they sleep and have no pain or narcotic longing.

During the treatment, if the patients are very nervous and uncomfortable, hypodermics of $\frac{1}{16}$ gr. strychnine, or even $\frac{1}{32}$ gr., can be given every four hours, or even every two hours, as the patient's need seems to demand. If every three hours the patients are made to drink 30 gr. of bicarbonate of soda dissolved in water, their vomiting and diarrhœa are much less, their abdominal cramps are markedly diminished, and they do not go on into the simulation of collapse that a few of them will do if the bicarbonate is omitted.

The authors have tried many remedies to relieve the headaches and other pains, and remedies to relieve the nausea and vomiting; aspirin and phenacetin and the other coal-tar products do not seem to give satisfactory results, and the patients are better without them than when they are given. The one drug that seems to relieve their nervous restlessness is the strychnine, and, if the bicarbonate of soda is pushed, their discomfort during the treatment remains at a minimum.

The convalescence of the patients under a daily injection of narcosan is interesting to anyone accustomed to narcotic addicts under treatment. The narcosan patients have a voracious appetite, are always hungry, especially for sugar, and, unlike after other treatments, can digest all they eat on the fifth or sixth day of this treatment without any digestive disturbances, and without any recurrence of their withdrawal symptoms. The natural habit of sleep returns to them sooner than after any other treatment. They rapidly improve in colour, and rapidly put on weight on the regular

prison fare. They acknowledge that they 'don't think of the dope'. Not infrequently patients sweat at nights, a few excessively, which ceases immediately on the cessation of narcosan. A few showed a blotchy, urticarial rash appearing fifteen or twenty minutes after narcosan injection, and disappearing in about two hours; a few showed a fine protein rash which soon disappeared. Three patients showed an internal strabismus, which disappeared entirely before they left the ward. These patients in convalescence crave fresh air and sunshine, and are eager for muscular action and work. They do not hesitate to mount ladders or scaffolds, they are sure of their equilibrium—a normal condition which those taken off narcotics by the reduction treatment rarely possess.

The authors conclude that narcosan has shown itself to be of unquestioned value, producing a successful withdrawal of the drug in a few days, in some instances with but little discomfort, and in all cases with less suffering than with the ordinary withdrawal method. The patients sleep without hypnotics of any kind during and after their treatment, and at the end of a few days are hungry, and digest easily all that their renewed and voracious appetites cause them to take. The treatment is easily carried out with much less detail than with the belladonna treatment, and with no delirium as in the hyoscine treatment, and leaves the patient free from depression and, as must be emphasized, with a returned ability to sleep.

REFERENCES.—¹*Practitioner*, 1927, Jan., 55; ²*Med. Jour. and Record*, 1926, Dec. 15, 764.

AMOEBIASIS.

Sur Leonard Rogers, M.D., F.R.C.P., F.R.S.

ETIOLOGY.—Changes of an interesting nature which *E. histolytica* cysts undergo in cultures have been described by W. Yorke and A. R. D. Adams,¹ who also in a further note report on the longevity and resisting powers of the *E. histolytica* cysts *in vitro*. C. F. Craig² describes a simplified culture medium for *E. histolytica* consisting of Locke solution containing one part to seven of inactivated human, horse, or rabbit blood serum, the first being best. Successful transfers have been obtained as late as eight days, but one or two days' intervals are best. In a further paper the same worker³ shows that a still simpler medium can be used, namely, sodium chloride 8 grm., calcium chloride 0.2 grm., potassium chloride 0.2 grm., and distilled water 1000 c.c., to which sterilized modified Ringer's solution there is added one part to seven of human blood serum inactivated by heating to 56° C. for half an hour, and the mixture kept at 37° C. to determine its sterility. This shows that egg albumen, blood, or dextrose is not essential. J. H. St. John⁴ has described and published microphotos showing the differential characters of the five human entamoebæ. The pathogenic *E. histolytica* can be recognized by its well-known flowing active movement, and in cultures the ring-shaped chromatin of the nucleus, but not the central karyosome, can be recognized; while in the case of the closely similar *E. coli* the movement does not transport the organism across the field of the microscope, and its eccentric karyosome is easily seen in cultural forms.

INCIDENCE.—W. E. McCulloch⁵ describes an epidemic of amoebic dysentery, controlled by discovering and removing infected native cooks, and he advocates the examination for amoebic disease of the households of Europeans living in Nigeria. B. Kaplan, C. S. Williamson, and J. C. Geiger⁶ report the occurrence of seven or eight cases of amoebic dysentery within a short time at a Chicago hotel, which was traced to one case and two carriers among the staff. Thirty-five cases had been treated last year in one hospital, so the disease is not uncommon there, and also they think in all parts of the United States. C. F. Craig⁷ also deals with the number of amoebic carriers in America, and

points out that protozoologists have found about 10 per cent of the people to be infected, and he thinks most of them show obscure symptoms not generally recognized to be due to the disease. Thus for every case passing mucus or blood there are several cases of slight diarrhoea alternating with constipation due to amoebic infection which are overlooked. Other symptoms are loss of appetite, pains and tenderness in the lower part of the abdomen, especially over the cæcum and sigmoid, a mild degree of anæmia, and neurasthenic symptoms. He attributes these to the absorption of toxins through the minute lesions or small ulcers produced by mild amoebic infection of the large bowel. Routine examination of the stools of all presenting such indefinite symptoms, and energetic treatment of any amoebic infections detected, are indicated, which would also lead to the diminution of new infections. M. Paulson and J. M. Andrews⁸ have had a very similar experience in Baltimore, where they found that specimens of fresh fæces obtained from the sigmoid through the use of the sigmoidoscope without previous purgation, in 210 persons, resulted in two and a half to three and a half times as many positive results being obtained as by microscopical examinations of stools passed in the ordinary way, largely owing to the material being obtained in a fresher condition. The incidence was twice as high in those who had not had a recent barium meal, which obscures the results.

TREATMENT.—R. N. Chopra, J. C. Gupta, J. C. David, and S. Ghosh⁹ report an investigation of the pharmacological action of Conessine, the alkaloid of *Holarrhena antidysenterica*, a small deciduous tree of the natural order *Apocynaceæ* growing in the Himalaya mountains at an elevation of about 8300 feet, which has long had a medicinal reputation in India. H. C. Brown in 1922 found this alkaloid had a marked amoebicidal action, and it inhibited amoebic growth in a dilution of 1-1,000,000. The present workers found that conessine kills *E. histolytica* in the stools of infected kittens in a dilution of 1-1,280,000 in 8 minutes in the presence of an alkali and in 18 minutes in its absence; it is thus as active as emetine with an alkali, and far more so in its absence, so that it may prove of great use in the treatment of amoebic dysentery. It has little effect on *Trichomonas hominis*. The hydrochloride, hydrobromide, and tartrate can be given subcutaneously or intramuscularly in 6 per cent solutions with only slight local effects, but intravenously it has a marked depressing effect on the auriculo-ventricular bundle, producing irregularity and heart-block, especially in cats, but not by the other methods of administration in the dilutions recommended. It has no great effect on the central nervous systems of animals. W. A. Young¹⁰ tried giving an injection of Emetine only when symptoms of dysentery recurred, in a laboratory-infected person who volunteered for experiment, and he found it quite effective and less depressant; so he suggests a trial of giving the drug every three or four days after the first 6 gr., or, if microscopical examinations can be carried out, injecting 1 gr. of emetine twelve hours before the multiplication of the amœbæ is due.

V. Coates and E. Hey Groves¹¹ report three cases of amoebic bowel disease, verified by finding the organism in the stools, in which they Removed the Vermiform Appendix, and in one case also drained an amœba-infected gall-bladder; one patient improved very greatly in spite of extensive disease, inflammation of the large bowel also being present, and the other two were also somewhat better for a time. They therefore suggest that the removal of small foci of infection surgically may be of benefit.

Amoebic Hepatitis and Liver Abscess.—A. I. Ludlow¹² reports his experience of 60 further cases of liver abscess in Korea, bringing his total up to 160. He supports Rogers' contention that this serious condition is easily preventable by early recognition and efficient treatment of amoebic hepatitis, and records

that "during an experience of fourteen years he had never seen an amœbic liver abscess develop in any Korean or foreigner who has been under the care of the staff of this institution". He has previously reported 100 cases of liver abscess treated by the **Open Operation** in the temperate climate of Korea with the very low mortality of 10 per cent (*see* MEDICAL ANNUAL, 1925, p. 17), and was naturally reluctant to try the aspiration method, but remembering an injunction of an old teacher to keep an open mind, he determined to try it. He now reports 43 cases treated by Rogers' method of **Aspiration and Emetine Injections**, with 1 death; in a letter to the reviewer this number is brought up to 50 with 1 death, or 2 per cent, and in his conclusions he states: "Aspiration is the method of choice". The open operation may still be required in selected cases. G. Shanks¹³ reports one case of amœbic abscess in the lung with nothing of note in the liver. S. N. Hayes¹⁴ advocates the administration of emetine without resort to aspiration, and he records a case which completely cleared up under this treatment, and two others in which the liver decreased in size; but the patients left hospital with still considerable enlargement of the liver, and they could not be followed up. In spite of these not very satisfactory results, he still advises the omission of aspiration.

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ANÆMIA, APLASTIC.

Ivor J. Davies, M.D.

A. G. Gibson¹ reports a case of aplastic anæmia of obscure origin where an apparent recovery resulted from the use of **Adrenalin**. The course was steadily downwards and became very critical, despite most careful investigation and treatment, when it was decided to try adrenalin. Daily subcutaneous injections of the 1-1000 solution (P. D. & Co.) in 2 to 5 min. doses were given. An upward trend took place within a week and continued without intermission to the date of the last observation—altogether a period of one year and nine months. A marked general improvement ensued, and when last seen the child was able to run about and play. The blood condition, although much improved, had not returned to normal. [In reply to inquiries as to the progress of this case Dr. Gibson kindly writes as follows: "In October, 1927, the patient was still in the same state, a small rather pale girl of 15 with a moderate degree of anæmia, a high colour index (1.05), and leucopenia (3120), of which the leucocytes were 25.7 per cent (801 instead of the normal 3000). The adrenalin is continued because it is still thought necessary, but there is no cardiac hypertrophy or high blood-pressure."]

REFERENCE.—¹*Lancet*, 1926, ii, 948.

ANÆMIA, PERNICIOUS. (*See* PERNICIOUS ANÆMIA.)

ANÆSTHESIA.

Joseph Blomfield, O.B.E., M.D.

Ether Convulsions.—The occurrence of severe spasmodic muscular contractions, described sometimes as 'jactitations' and sometimes as 'convulsions', during the inhalation of **Ether**, has been described by various anæsthetists during the year.^{1,2} The phenomena have often, but not always, been associated with a fatal issue to the case, death having occurred sometimes actually on the operating table, and in other instances hours after the convulsions had ceased or when they had recurred after the return to bed. These cases are

regarded by those who describe them as unlike any hitherto recorded in connection with ether inhalation, and naturally they have aroused much speculation as to their nature and their causation. They have been variously attributed to atropine poisoning,³ to anoxæmia,⁴ and to impurities in the ether. The first two causes may be definitely ruled out: atropine because the phenomenon has appeared when atropine has not been used at all; and anoxæmia because its absence is definitely attested by competent observers in some of the cases, and because it is a consequence rather than a cause of the 'convulsions', and because anoxæmia has been extremely common in the past but the phenomenon under discussion has not arisen. K. B. Pinson⁵ believes that excess of CO₂ in the circulation is the primary cause, but if this is correct the comparative rarity of the convulsions is hard to explain. Wilson² attributed the symptoms to impurities in the ether used, and showed how modern methods of giving ether, by blowing oxygen or nitrous oxide, or both, through ether are prone to the formation of impurities in the ether, particularly if the same ether is used on more than one occasion. It cannot be said, however, that Wilson's arguments are conclusive, for Wensley Bourne⁶ has shown the insignificant effects of aldehyde or peroxide, the commonest impurities, unless present in amounts which are not suggested by Wilson's investigations. The causation of these 'convulsions' cannot be regarded as yet certain, but the practical lesson seems undoubtedly to be to take every precaution (a) to use ether that is pure, (b) to limit the amounts inhaled as closely as possible, (c) to avoid all oxygen deprivation. The phenomenon is, in fact, probably due to a toxic effect of ether on the brain cells, and is associated only with the inhalation of formidable amounts of the drugs unless the patient is especially susceptible, which commonly arises from a condition of septic absorption.

Mennell,¹ in connection with deaths after ether inhalation, relates a remarkable example of *fat embolism*, occurring in a bedridden patient after an orthopædic operation.

The use of Carbon Dioxide for hastening the onset of anæsthesia, which it does by stimulating pulmonary ventilation and thus leading to rapid inhalation of large amounts of the anæsthetic vapour, is extolled by C. N. Chipman.⁷ This author believes that he induces anæsthesia with the carbon dioxide itself. For this purpose he starts with a vapour of CO₂ 25 per cent and O 75 per cent. After about ten breaths the patient is unconscious. Ether is then admitted until full anæsthesia is obtained. The wisdom of employing so high a percentage of CO₂ may be questioned, and for the actual attainment of anæsthesia even so high a percentage of CO₂ as this is insufficient, if we may believe the experiments on animals carried out years ago by Eréhant. This experimenter found that, with rabbits at any rate, at least 45 per cent of CO₂ with oxygen was needed to gain anæsthesia. Chipman claims for his method a quick and quiet induction, and believes that bleeding in the subsequent operation is much lessened by the CO₂ induction. The coagulation time of the blood is, he states, lowered in patients who have been given excess of CO₂. The length of time of the operations is not given, and it is difficult to believe that after a few minutes any effect on the blood would not have passed off which might have accrued from the initial short inhalation of CO₂. Decrease in the coagulation time of the blood is also said to occur during anæsthesia from ethylene.⁸ In one instance the alteration was from six minutes before, to two and a half minutes after, taking the gas.

Carbon-monoxide poisoning is a danger especially to be guarded against when Ethylene is employed for anæsthesia.⁹ Tests made on the blood of three patients who showed toxic symptoms after inhalation of ethylene proved that

carbon monoxide was the agent responsible. Subsequent examination of various brands of ethylene showed that the amount of carbon monoxide allowed to be present in some instances was dangerously high. These observations were made in America, and so far there has been no incrimination of any ethylene manufactured in Great Britain, on the score of carbon-monoxide impurity.

Hiccup during anæsthesia may be a great inconvenience to the surgeon and a source of danger to the patient. It is often difficult to control, for the causation is generally not obvious. S. J. Cantor¹⁰ finds that the spasm is immediately arrested by forcibly flexing the head on the chest for a couple of seconds. Relapse is uncommon, and is cured, if it occurs, in the same manner.

Respiratory obstruction during anæsthesia is generally quickly righted by attention to the tongue and lower jaw. There are instances, however, where the usual measures for establishing an air-way do not succeed, and H. M. Wharry¹¹ demonstrates the decisive and often undetected part which the epiglottis may play in these instances. He shows the variety of which the form and structure of the epiglottis is capable, and demonstrates the liability for an unusually long epiglottis to become tightly impacted over the laryngeal aperture, with its extreme end curved up and closely applied to the posterior pharyngeal wall. Wharry has seen three cases of complete and many of partial obstruction to respiration from this cause. For relief, a finger must be passed to the back of the mouth, and the epiglottis raised and pressed against the base of the tongue. Until this is done, artificial respiration is useless. If the forefinger is not long enough, a spatula or a closed sponge forceps can be used to prop forward the epiglottis.

J. S. Lundy¹² has made a statistical investigation of *pulmonary complications* after ether and ethylene-ether anæsthesia respectively in two series of six hundred cases each. He gives a large number of comparative figures bearing on the lesion dealt with, pre-medication or none, and the two different methods of anæsthesia. No fresh lesson is taught by this careful scrutiny, and Lundy concludes that "it is impossible to draw general conclusions regarding the comparative value of the two types of anæsthesia or the effect of the pre-operative administration of hypnotics. What is proved in one type of operation is disproved in another". The old rule in fact holds good that is laid down by long experience, viz., that for every case the method and agent for the anæsthesia must be selected according to the particular circumstances of the individual patient and operation.

The treatment of *bronchitis after ether* by intramuscular injections of eight drops of Ether in an equal amount of sterilized Olive Oil has been advocated by Bier.¹³ It is, of course, diametrically opposed to the common method of treatment in these cases, which consists in the use of atropine or belladonna by injection or mouth.

W. Meyer¹⁴ believes that *post-operative vomiting* is best prevented by keeping the patient deeply under the anæsthetic till the close of the operation and then washing the stomach out thoroughly through a tube. This is done with the patient in a slight Trendelenburg posture. This posture is changed to the Sims posture when the patient is in bed. Wensley Bourne¹⁵ finds that rectal administration of a **Phosphate Solution** directly after operation diminishes nausea. He correlates this with the observation that during anæsthesia the acidosis which arises is accompanied if not caused by the phosphoric acid leaving the muscles and appearing in the liver.

The relation of anæsthesia to *cardiovascular affections* was fully discussed by F. W. Price and J. Blomfield.¹⁶ The former pointed out that, of the various

forms of cardiac irregularity commonly met with, two were important to the anæsthetist. These are (a) irregularity due to heart-block, and (b) irregularity due to pulsus alternans unassociated with tachycardia. The latter form of irregularity is an indication of extreme exhaustion of the heart muscle. Blomfield stated that *shortness of breath* is the most important cardiac sign for the anæsthetist, and the breath-holding test is his best simple guide to the efficiency of the myocardium.

Discussing the *most agreeable form of induction* for anæsthesia, V. Lobmayer¹⁷ declares in favour of starting with drops of eau de Cologne on a mask, which is then wetted with *Solästhin*. This is a pure preparation of dichloromethane (CH_2Cl_2) and has a very fleeting anæsthetic action. Its smell is like that of chloroform.

Professor Lotheissen¹⁸ describes a case in which an explosion occurred during the use of a mixture of *oxygen and ethyl chloride*. Although no serious damage was done, the occurrence showed the need for great care if this combination of gases is employed.

There have been many instances¹⁹ during the past year of the employment of *Intracardiac Injections of Adrenalin* to combat *collapse* during anæsthesia. The injection has been employed for circulatory failure under chloroform, and also for syncope during spinal analgesia. Undoubtedly it has saved life when other measures have failed to restore the heart-beat. A solution of 1-1000 is used, and a syringe should be fitted with a needle 6 to 8 cm. long. This is plunged into the fourth left intercostal space just beyond the sternal edge. According to d'Allaines, it does not matter what part of the heart receives the injection. Chevrier²⁰ considers the injection good treatment for collapse during spinal analgesia, permissible in early chloroform syncope, and useless if not dangerous in late chloroform collapse. Italian surgeons also favour this line of treatment.²¹ The needle should be inserted at right angles to the chest for the first inch or so, and then directed towards the middle line.²²

The effect of ethylene on the blood-pressure as compared with that of nitrous oxide has been studied by L. F. Sise,²³ who finds that it is higher with the former anæsthetic.

From an experimental investigation into the *effects of general anæsthetics on the muscular activity of the gastro-intestinal tract*, G. H. Miller²⁴ concludes that during surgical anæsthesia with ether or chloroform there is loss of tone and almost complete inhibition of both rhythmic and peristaltic contractions in stomach, small intestine, and colon. During the recovery period the stomach recovers slowly and shows some degree of depression for one hour or more. Small intestine and colon recover very rapidly. Nitrous oxide and oxygen anæsthesia produces marked increase in the size of contractions of stomach, ileum, and colon. When the gases are discontinued there is inhibition of activity of the gastro-intestinal tract, peristalsis ceasing, and the muscular depression lasting for an hour or more.

M. P. Rucker²⁵ has made a study of the *action of various anæsthetics on uterine contractions*, employing hystero-graphs for the purpose. He concludes that all general anæsthetics reduce uterine contraction, and so also does sacral analgesia when adrenalin is used with the injection. The hystero-graphs were obtained by connecting the stem of a Voorhees' bag with a mercury manometer, the distal arm of which carried a flow and a writing point.

Avertin (E 107),²⁶ an organic bromine compound ($\text{CBr}_2\text{CH}_2\text{OH}$), has been used in a few hundreds of cases for the production of anæsthesia by *rectal injection*. In using it about 6 gr. for each 10 lb. of the patient's body weight are dissolved in 200 c.c. distilled water of about body temperature. The solution is introduced high up into the rectum, after which a cotton-wool tampon

smear with boric ointment is inserted into the anus. In from two to five minutes the patient sinks into a state of analgesia and amnesia. True surgical anæsthesia is obtained by trifling additions of an inhaled anæsthetic. The narcosis obtained by avertin lasts from two to four hours and the after-effects are slight. This drug was introduced by Willstätter and Drusberg, and has been pretty extensively used in Germany,²⁷ particularly for gynaecological operations.

Acute dilatation of the stomach, more commonly seen as a sequel to operation, may also occur during anæsthesia. McIver²⁸ describes a case and mentions several others and discusses their causation. The treatment is passage of a stomach tube, which immediately relieves the condition. Recurrence is not usual. The mechanism by which the dilatation occurs may be explained by McIver's experiments, showing that air may accumulate in the upper parts of the œsophagus during anæsthesia, and be forcibly sucked into the stomach if there is any obstruction to escape of air through the mouth. The lower third of the œsophagus is composed of smooth muscle-fibres, and peristalsis here is not abolished by anæsthesia. Thus peristaltic waves may aid the descent of air from the upper œsophagus into the stomach, when the lowered muscle tone of anæsthesia would assist its retention.

Sickness after ether anæsthesia is believed by Monsarrat²⁹ to have direct association with pancreatic insufficiency. There is, he states, no doubt that ether interferes with pancreatic function. Minnitt has studied the effect of ether on sugar tolerance, and the incidence of ketosis and acidosis after ether anæsthesia. Insulin provides a direct remedy for this complication of pancreatic insufficiency. It should be employed prophylactically. Ten units are to be given directly the operation under ether is finished, and if vomiting occurs the dose is to be repeated as often as necessary. Minnitt's investigations showed a parallel relation between blood-pressure curves and pancreatic disorganization.

The merits of *combining local with general anæsthetics* were maintained by several authorities in a discussion on anæsthesia for abdominal surgery.³⁰ Some preferred the combination of 'twilight sleep' with general anæsthetics. Finsterer strongly advocates the extensive use of regional anæsthesia for abdominal work, and finds *Tutocain* much more effective than novocain. A solution of only $\frac{1}{3}$ to $\frac{1}{2}$ per cent is used. Pre-operative injections are employed of 0.02 grm. *Omnopon* one hour, and 0.01 grm. *Morphia* with 0.00025 grm. *Atropine* a quarter of an hour, before operation. Mesenteric injections are regarded by Finsterer as the simplest and least dangerous method of regional anæsthesia, and are entirely satisfactory for resection of a movable ulcer or growth of the stomach; when the ulcer penetrates to the pancreas, narcosis is needed also. He regards *splanchnic anæsthesia* as a progressive step over mesenteric, because through its use there is complete anæsthesia of the peritoneum of the posterior abdominal wall. Finsterer prefers the anterior route of Braun to the posterior of Kappis. Combined with a light general anæsthesia splanchnic anæsthesia is, in Finsterer's opinion, the method of choice for big resections of the stomach.

Persistent after-effects from spinal (intrathecal) injection have from time to time been recorded, and the possibility of their recurrence must always be taken into account when considering the advantages and disadvantages of spinal as opposed to general anæsthesia in any particular case. However the two methods may compare as regards immediate accidents, the chance of lasting ill-effects subsequent to operation is probably much greater after the use of spinal than it is after the use of inhalation anæsthetics. This is not to say that it is anything but very uncommon after either method. P. Bazy³¹

gives the details of a patient seen three years after he was operated on under spinal analgesia for an inguinal hernia. This person had for twelve hours after operation a violent reaction characterized by profuse sweating and a nervous condition which produced a syncope lasting for several minutes. There was inability to pass urine and complete insensibility of the lumbar and genital regions. These symptoms persisted after a month's treatment with electricity. The passage of feces was not perceived, but the need for defæcation was made obvious by a peculiar sensation at the pubis. The need for urination, which was absent for eighteen months, has become progressively shown by the usual sensation, but spontaneous contraction of the bladder has not returned. At the end of three years the patient has the sensation of an abnormal size of the testicles, which are insensible to touch, and of a constant foreign body seeking to pass the sphincter ani. M. C. Lepoutre³² relates, à propos of the above, a case in which, also after three years, there was diurnal incontinence of urine with anæsthesia of the anal region. He concludes his article with the statement that, in spite of the denials of some authors, definite nervous accidents do occasionally follow on spinal injection. These may, he believes, be due to an extradural hæmorrhage, to an irritant action of the injected drug, or to trauma of a nerve centre or of a bundle of fibres.

With regard to the unpleasant symptoms sometimes evoked by spinal injection, particularly pronounced *fall in blood-pressure*, Daniel³³ puts forward an interesting explanation on which he bases a line of treatment. The effects are, he considers, of anaphylactic nature, and due to the disturbance of the vago-sympathetic equilibrium. A small quantity of cerebrospinal fluid introduced into the blood-stream may cause slight shock and bring about desensitization of the organism for a time. Shock from the anæsthetic injection is then avoided. Daniel's procedure is this: 5 to 10 c.c. cerebrospinal fluid are withdrawn from the patient in the sitting position, and the anæsthetic is then injected. The patient is now laid down and told to breathe deeply. The removed fluid is then injected subcutaneously or into a vein at the bend of the elbow. About five minutes later the operation is started. Subcutaneous injection was used in 36 cases and intravenous in 66. Results were better with the latter. The pulse-rate rises to 110 after two minutes, but is normal at the end of fifteen minutes. Breathing is slightly quickened for six minutes after the injection. The colour of the face was good throughout operation, nausea and vomiting were absent, and late results were excellent. It is held that by stimulating the sympathetic the injection of cerebrospinal fluid increases the arterial pressure, and secondarily the cerebrospinal pressure too.

Reviewing over six thousand cases of spinal analgesia, H. Martin and R. Arbuthnot³⁴ conclude that the fall in blood-pressure is greater than with any other form of anæsthesia. The Trendelenburg position, administration of oxygen, and injection of pituitary extract or of epinephrin are the remedies used to counteract the circulatory depression. Epinephrin acts slowly but intensely, the effect lasting for about twenty minutes. Pituitary Extract is less powerful but more lasting. Caffeine is of doubtful value. The authors believe that loss of spinal fluid should be guarded against as carefully as possible, and that headaches are best relieved by lowering the head, sedatives, and ice-caps. In a few cases of severe headache intravenous saline was given with success.

After testing Stovaine as a *local anæsthetic for nose, throat, and ear work*, F. Muecke³⁵ states that the drug should have as big a place as cocaine and novocain in that field. It is particularly valuable for work on the mucous membrane, less good when the bone is attacked. As a laryngeal spray, 5 per cent stovaine was used with good result for the removal of papillomata and

foreign bodies. Anæsthesia is slower and vasoconstriction is less than with cocaine when stovaine is used in the nose.

The desirability of *prolonging local analgesia*, so that no pain may follow operation, has long been recognized, but attempts made, chiefly by the combined use of quinine solutions, have not been successful. This was due to the irritation of tissues caused by the injections designed to prolong the anæsthetic effect. A recently introduced drug, Eucupin, has both the power of prolonging analgesia and of exercising strong antiseptic action, without irritating the tissues on which it works. Eucupin was discovered by Morgenroth³⁶ in the course of a research undertaken in order to find drugs which, while highly effective against bacteria, were also non-irritant to the tissues, so that they could be injected without harm. Morgenroth found a series of drugs which besides their antiseptic had also anæsthetic properties. These drugs were formed through the reduction of quinine into hydrochinin and the formation of higher homologous compounds by substitution. Tested on the rabbit's cornea, hydrochinin and the next in the series, optochin, had an effect two and a half times as strong as that of quinine. Passing through the next items in this group, a compound was found which in animal experiments was thirty times more effective than quinine as an anæsthetic. This new synthetic drug is eucupin. G. de Takats³⁶ has experimented with eucupin since 1919 in order to determine whether it could prolong analgesia without irritating tissue. His conclusions are in favour of its use in association with *Tutocain*. In combination with this analgesic 0.1 per cent solution of eucupin causes a post-operative analgesia of about twenty-four hours. This combination of drugs is soluble in water, can be sterilized, and is not toxic in the quantities needed for analgesia. It does not cause any tissue reaction or any disturbance in wound healing, as shown by intracutaneous tests, microscopic sections, and a hundred operations performed with its aid. Tutocain (0.2 per cent) was used instead of $\frac{1}{2}$ per cent novocain. An analgesia of longer than twenty-four hours is not considered desirable because of possible trophic disturbances. De Takats³⁷ makes some wise observations on the choice between local and general anæsthetics, and points out that for abdominal work, whenever a general exploration is planned, general anæsthesia is the method of choice. For very long operations splanchnic analgesia gives better results. In many abdominal operations general anæsthesia should be combined with local injections, which not only effect relaxation but save from five-tenths to nine-tenths of the general anæsthetic.

Tutocain is favourably reported on also by several German writers³⁸ in whose hands it has given results superior to those obtained with novocain. The symptoms of poisoning by this drug were observed in one case in which accidentally at least 90 c.c. of a $\frac{1}{2}$ instead of a $\frac{1}{4}$ per cent solution were injected. The phenomena produced resembled those seen in cocaine poisoning, and were accompanied by speech defects and amnesia. P. Valdoni³⁹ has employed tutocain in 500 cases of spinal analgesia, and finds no contra-indications to its employment thus.

Splanchnic analgesia continues to be recommended warmly by those who use it for severe operations within the upper abdomen. The physiological basis of this method receives interesting criticism from Mecker,⁴⁰ who argues that "breaking conductivity in the splanchnic nerves is not in accordance with sound principles of anatomy or physiology. The pain is caused by the stimulation of spinal and not sympathetic nerve filaments . . . clinical experience with splanchnic anæsthesia proves it to be inefficient—it is the least important of all the factors concerned in the success of an abdominal operation". In answer, De Takats⁴⁰ replies that the question whether the pain produced during an upper intra-abdominal operation is carried by sympathetic

or by spinal fibres is not so easily settled, but anyhow, that the fibres concerned run in the splanchnic nerves is highly probable. The underlying principle of splanchnic anæsthesia is to block the splanchnic nerves as well as the lumbar rami communicantes at two isthmic points, instead of blocking the rami individually, which means 22 injections from the fifth dorsal to the third lumbar on each side. De Takats reviews a large number of reported cases as well as his own, and concludes that all fatalities have occurred after injections by the posterior route. Intravenous and intraspinal injections have been responsible. Patients with the low blood-pressure of complete obstruction and peritonitis should not be submitted to splanchnic anæsthesia. The best premedication is stated to be Veronal the night before and Morphia and Atropine half an hour before the splanchnic injection.

Anhydrous Cocaine has been used by J. R. Wells⁴¹ in a further series of 557 cases. He regards this anæsthetic as having peculiar properties: (1) The entire body including the head can be safely rendered insensitive to pain; (2) The height level of analgesia can be accurately determined within two inches; (3) The duration of the analgesia can be prognosticated within five to ten minutes; (4) The area of analgesia once established is unalterable; (5) Analgesia is immediate. Anhydrous cocaine retains the property of cocaine of affecting sensory nerves only and leaving the motor and vital functions undisturbed. The drug needs scrupulous care both in its manufacture and in its keeping. The finest cocaine is used. To 1 grm. of crystal cocaine, 25 c.c. absolute alcohol are added in a glass flask, which is agitated and then allowed to stand four hours. Then 200 c.c. dry ether are added while the flask is gently shaken. A crystalline deposit and precipitate are formed. These are allowed to stand about an hour; then the liquid is siphoned off and the crystals are dried in a sulphuric acid vacuum chamber. The crystals are removed in a sterile manner, weighed, and sealed in sterile amber glass ampoules, care being taken not to allow the crystals to be long in contact with the air. A culture is taken from each ampoule before sealing. Wells states: "A new drug has not been created, but cocaine has been further purified and its toxicity removed. Its action is unaltered so far as analgesia is concerned. There has been no death due to anhydrous cocaine spinal analgesia *per se*".

Poisoning symptoms produced by the use of **Cocaine** are not prevented by preliminary injections of morphia, scopolamine, or atropine, as has been often attempted, but they appear to be averted by the use of **Barbitol**, which is methyl barbituric acid.⁴² Animal experiments indicated that this drug is an efficient antidote to cocaine. Usually the barbitol is given by the mouth in 12-gr. doses.

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ANEURYSM.*Sir W. I. de C. Wheeler, F.R.C.S.I.*

From time to time the reviewer has reported the progress of a case of *abdominal aneurysm* operated upon in August, 1910, by the introduction of a cage of 150 inches of **Colt's Wire**. At the time of operation the aneurysm was thin-walled and seemed at operation ready to burst. The patient has in recent years developed signs of tabes, but is still at work, seventeen years after the introduction of the wire. This case has lived longer after wiring than any other on record. Most of the cases mentioned by Osler¹ lived from a few hours to six months after operation, one surviving three and a half years. The introduction of Colt's apparatus, and the recognition that the placing of a foreign body into an unhealthy area, such as wire in an aneurysm, requires an aseptic technique of a very special kind, has made the operative treatment of abdominal aneurysms a simple procedure.

Giordano² reports the case of a man, 49 years of age, who entered hospital with a tumour believed to arise from the lesser curvature of the stomach. Fluoroscopic examination showed a defect in the lesser curvature. Pulsation was present, but was thought to be transmitted. At operation an aneurysm of the aorta was found in the region of the coeliac axis. Through a large syringe needle, a 30-cm. piece of thin copper wire plated with silver was passed into the aneurysm and coiled within it. Antisyphilitic treatment was employed. On examination with X rays two years and three months later, it was seen that the upper part of the wire had broken off and had risen in the aorta, curving with the arch of the vessel. This writer recalls articles by G. H. Colt, C. J. Marshall, and C. P. G. Wakeley,³ who recommend that because of the danger of acute dilatation of the stomach from the pressure on the pyloric or prepyloric region, gastro-enterostomy is advised after the insertion of the wire into the aneurysm. The reviewer, however, is not convinced of the wisdom of this procedure. He operated on one case in 1912. After introduction of the wire, gastro-enterostomy was performed, as the aneurysm appeared to be obstructing the pylorus. The loop of jejunum fixed to the stomach became strangulated by pressure between the aneurysm and the abdominal wall. The consequent vomiting led to rupture of the sac.

H. A. Hare⁴ reports two additional cases of *aneurysm of the thoracic aorta* treated by **Wiring with Electrolysis**. In the first case the X-ray examination confirmed the diagnosis of aneurysm of the last portion of the transverse and the beginning of the descending arch. Operation was decided upon owing to the steady increase in size, and the pain required more and more morphia. Fifteen feet of wire made of platinum (30 per cent) and gold (70 per cent) was inserted at the point of greatest pulsation through an insulated needle, and 5 ma. of electricity turned on. Every three minutes the milliamperes were increased by 5 until a total of 45 was reached, at which point the current was maintained for ten minutes, after which it was cut down in steps of 5 ma. every three minutes until it was shut off. Pain was relieved and pulsation was notably decreased after operation. He died about two and a half months later in coma. His speech had become slurred, he was drowsy, the right pupil was dilated, and his symptoms suggested syphilitic involvement of the bulb. In the second case there was also marked relief from pain, but death took place two months after operation from rupture of the sac into the œsophagus. It is pointed out in this paper: (1) That only sacculated aneurysms are suitable for wiring and electrolysis; (2) The more sharply defined the sac, the better is the chance of a good result; (3) Operation is contra-indicated if the sac is distal to a large fusiform formation of the vessel.

[*Post-operative treatment* of aneurysms should include rigorous **Antisyphilitic Measures** and the use of drugs such as **Sodium Citrate**, **Calcium Chloride**.

and **Parathyroid Extract**, which promote clotting by decreasing the coagulating time of the blood.—W. I. de C. W.]

E. Holman⁵ makes some observations on the *surgery of the large arteries*. He states that ligation of the innominate artery carries a 66 per cent mortality. He reports a case admitted to hospital about five weeks after a pistol-shot wound in the right clavicular region. There was a large tense pulsating swelling above the clavicle on the right side, extending from the mid-line in front to the anterior border of the trapezius behind (*Plate I, Fig. A*). The bullet was shown by X rays to lie in the region of the left apex. A thrill could be felt, more pronounced in systole, and on auscultation there was a loud continuous murmur. A diagnosis of varicose aneurysm of the subclavian vessels was made. The operation was planned to expose the subclavian artery and vein by resection of the clavicle, and the intention was either to close the wounds in the vessels, or to perform a quadruple ligation proximal and distal to the abnormal communications. When the mid-portion of the clavicle was excised it was found that the periosteum was missing behind, and it became apparent that the clavicle formed a part of the wall of the aneurysm. The aneurysm burst, and there was a great gush of arterial and venous blood under pressure; this was controlled by digital pressure. Meanwhile the assistant continued with the resection of the clavicle and sternum. A second assistant exposed the innominate artery, which was controlled by a temporary tape ligature. The common carotid artery was exposed and occluded in a similar manner. The pulsation and the swelling ceased, and it was possible to release the pressure of the thumb and to introduce a number of interrupted silk sutures. Release of the ligature around the carotid artery was not followed by bleeding, but release of the tape encircling the innominate artery caused return of pulsation with some bleeding. The innominate artery was therefore permanently tied. Twenty hours after operation a feeble pulsation had returned to the right wrist; four days after operation the pulsatile swelling had subsided almost completely and the neck had again resumed a normal contour. In *Plate I, Fig. B*, the patient is shown a year after the operation. In spite of the failure at operation to demonstrate a definite communication between the artery and vein, Holman considers that all the clinical evidence, together with the escape at the operation of both venous and arterial blood from the defect in the aneurysmal wall, justified the diagnosis of varicose aneurysm of the subclavian vessels. If this diagnosis be accepted, it is difficult to explain the success of this operation by the simple ligation of the innominate artery, and it seems highly probable that the occlusion of the subclavian vein contributed to the effectual elimination of the aneurysm. This inference is made because of experimental observations that complete cessation of the thrill and bruit of a fistula follows the ligation of the vein proximal to the abnormal communication.

Holman draws attention to the fact that proximal ligation of the artery for arteriovenous communications was followed in over 50 per cent of cases by gangrene of the limb. It follows that the ligation of a large artery for injury should be accompanied also by the occlusion of the satellite vein. Probably the operation of choice for varicose aneurysm is quadruple ligation of the main vessels proximal and distal to the fistula, with excision of the communication. Attention is called in Holman's paper to the effect of simultaneous ligation of the carotid artery and jugular vein. Ligation of the common carotid artery is frequently followed by hemiparesis of the opposite side due to nutritional disturbances in the cerebrum. Convulsions, drowsiness, coma, cardiac and respiratory irregularities, etc., are not uncommon. Makins very emphatically advised occlusion of the jugular vein whenever ligation of

PLATE I

SUBCLAVIAN ANEURYSM: SUTURE OF INNOMINATE ARTERY



Fig. A —Photograph before operation. The circle indicates point of entrance of bullet. Note the evident enophthalmos.



Fig. B.—The patient a year after the operation.

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the common carotid artery was considered. In subclavian aneurysm it is recommended by some to tie the common carotid in addition to the innominate artery, but Holman thinks that the ligation of both innominate and carotid arteries probably increases the percentage of subsequent gangrene in the limb unless the innominate vein is also ligated. In all these operations, asepsis must, of course, be assured, and drainage is contra-indicated. A coarse ligature such as a broad tape should be applied to the large arterial trunk rather than fine ligatures, and, if possible, division of an artery between ligatures should supersede ligation in continuity. This applies even to the abdominal aorta. The ligature should be tied so as to occlude the artery, but not to crush it. [The reviewer⁶ has called attention to the necessity for ligation of both artery and vein in injuries to the great vessels of the limb. One of his cases was a child, age 8, who developed a diffuse traumatic aneurysm in the thigh, the result of injury to both artery and vein received during some street fighting. When there is a substantial interval between the date of injury and the date of operation, the collateral circulation is always sufficient to ensure the circulation of the limb after ligation of the vessels at the site of injury. Makins says that a capacious vein affords a too ready channel of exit for the diminished arterial supply, and, furthermore, the small amount of blood after ligation of the artery is maintained within the limb for a longer period.—W. I. de C. W.]

A. K. Henry⁷ describes a new method of *ligating the first stage of the left subclavian artery from behind*. He draws attention to the fact that the anterior approach to the left subclavian is notoriously difficult. The posterior route has the merit of simplicity (Fig. 3). Surgery advances through simplification to security. The approach is obtained by costo-transversectomy at the level of the second rib on the left side. Depression of the pleural dome leaves the artery naked from the aorta to the first rib; no structure of importance intervenes between the operator and the vessel. The first stage of the vessel can be ligatured in any part of its course, and its branches can be tied with relative ease. Hailes, of Melbourne, is quoted as having used this method with success in the case of a left subclavian aneurysm the size of a cricket ball. The ligature was placed about three-quarters of an inch above the aortic arch. Hailes expresses the belief that his case was inoperable from in front, even with a resection of the clavicle and sternum. Henry describes the operation thus:—

A good headlight should be used, but in the cadaver I have repeatedly tied the artery without artificial illumination. The patient should lie prone, with the left shoulder clear of the table and the left upper limb hanging

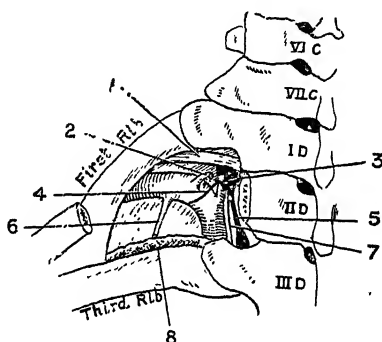


Fig. 3.—The relations of the first stage of the left subclavian artery seen from behind after removal of the 2nd dorsal transverse process and part of the 2nd rib. The costophrenic, and the thoracic duct which stripes its left side, are not shown in the figure: they are nearer the middle line. To see the origin of the subclavian artery from the aortic arch and to tie the *proximal* part of the artery, the surgeon stands opposite the head of the table. 1, 1st dorsal nerve. 2, Costocervical trunk. 3, 1st dorsal ganglion of sympathetic concealing vertebral artery. 4, Ansa subclavia crossing subclavian artery. 5, Sympathetic cord passing to 2nd dorsal ganglion. 6, Internal mammary artery. 7, Inferior cardiac branch of sympathetic. 8, Pleural dome retracted downwards. (Figs. 3 and 4 reproduced by permission from 'Exposures of Long Bones and Other Surgical Methods', 1927, Bristol, John Wright & Sons Ltd.)

vertical. Make the upper dorsal region as kyphotic as possible. This gives the space between the scapula and the vertebral column its maximal width.

1. Find the 7th cervical spine. Mark : (a) A point four finger-breadths above it and one finger-breadth to the *right* of the middle line ; (b) A similar point six finger-breadths below the 7th spine ; (c) A point over the middle of the spine of the left scapula. Join these three points by the incision shown in the illustration (Fig. 4), which is carried down to the sheath of the trapezius muscle.

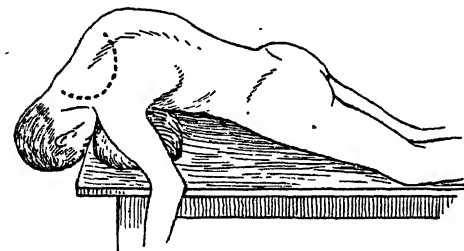


Fig. 4.—Showing skin incision and position securing maximum abduction of the scapula.

Raise the flap of skin and subcutaneous tissue thus outlined and turn it over to the *right* of the middle line.

2. With a vertical cut one finger-breadth to the left of the vertebral spines, divide the origins of (a) the trapezius, (b) the rhomboids, and (c) the serratus posterior superior. Do this first at the middle of the wound where the silvery tendon of the serratus indicates the depth reached. Extend

this incision throughout the entire length of the wound. Retract the divided muscles outwards. The pointed caudal end of the fleshy splenius is now exposed.

3. At the level of the 7th cervical spine, and three finger-breadths from the middle line, find the tip of the first left dorsal transverse process, remembering that it is the first which projects beyond the edge of the splenius. Find the second left rib.

4. Clear the transverse process of the second dorsal vertebra as far as the lamina. Clear at least three inches of the second rib. Divide the transverse process at its root and remove it. Divide the rib as far as the wound will permit from the costo-transverse articulation.

5. Raise the proximal cut end of the rib. With finger push the pleura away from its head and neck. Rotate the rib segment and divide its attachments. The sympathetic cord is now seen close to the vertebral body, lying on the pleura like a tape.

6. Very gently push the pleural dome downwards and outwards from the vertebrae. A small strand will now be found holding the pleura to the neck of the first rib. This strand is a branch of the superior intercostal artery. Divide and tie it. The pleural dome can then be freely depressed, and the left subclavian is felt by the finger passed vertically and at a tangent to the vertebral body. *The removal of the transverse process, together with the costal neck, permits of this direct approach.* A broad malleable retractor keeps the lung and pleura out of the field. It should be polished so as to reflect light into the cavity. The artery is isolated under direct vision by blunt dissection, and its sheath is opened in the usual manner, using a long dissecting forceps. The ansa subclavia should be avoided.

7. The surgeon stands facing the head of the table. An aneurysm needle with a slot eye (or, better, the cup-and-ball needle described in the author's book) is passed with the *left* hand from within outwards : introduction of the right forefinger into the wound facilitates this manoeuvre. The eye is threaded with a ligature, or with a guiding thread to which a definitive ligature (a tape, for example) is attached. Ample space is afforded for securing the knot.

The internal mammary and costocervical trunks can be tied at their origins.

PLATE II

ANEURYSM OF THE ABDOMINAL AORTA



Fig. 1.—Appearance of aneurysm at time of operation, and method of application of ligatures to abdominal aorta.

*Plates II, III by kind permission of the
'Journal of the American Medical Association'*

PLATE III

ANEURYSM OF THE ABDOMINAL AORTA—*continued*



Fig. B.—Appearance of specimen obtained at necropsy. The aneurysm viewed from the posterior aspect. The posterior wall of the aneurysmal sac was formed by the bodies of the lumbar and sacral vertebrae. There is complete obliteration of the aorta at the site of the ligature. The remains of the fascia ligature are marked by the fine silk ligature visible between the aorta and vena cava. The braided silk ligature can be seen to lie completely within the lumen of the obliterated artery. The left common iliac artery is completely obliterated in the wall of the aneurysmal sac. The right common iliac artery can be seen to be obliterated almost completely. The cross-section of the completely obliterated left iliac vein can be seen lying near the left hypogastric artery. The entire aneurysmal sac was filled with partially organized clot.

The vertebral artery is obscured by the cervicodorsal ganglion of the sympathetic, but can be safely ligatured by opening the subclavian sheath close to the vertebral origin and passing an aneurysm needle round the parent trunk so that its point appears in the angle between the subclavian and the vertebral artery. The thoracic duct may thus be avoided. The thyroid axis is difficult to secure by the posterior route.

B. Brooks³ describes a successful case of *ligation of the aorta*. He points out that the aorta was first ligated in the human being by Sir Astley Cooper more than a hundred years ago. Brooks's patient was a negro, age 59, suffering from a large abdominal aneurysm which filled the entire lower half of the abdomen. The peritoneal cavity was opened by a mid-line incision from the symphysis pubis to the xiphoid cartilage. The aorta was exposed for a distance of about one inch distal to the origin of the inferior mesenteric artery. It was further freed posteriorly until a rubber-covered clamp could be applied just proximal to the origin of the artery. An attempt was made to remove the aneurysmal tumour, the clamp controlling the aorta. This attempt was abandoned as the posterior wall was found to be formed of the bodies of the lumbar and sacral vertebrae. An accidental tear in the sac of the aneurysm was controlled by thumb pressure and afterwards by sutures. The ligature material used was a strip of fascia lata from the thigh. It was passed round the artery twice, just distal to the origin of the inferior mesenteric artery. The fascia ligature was tied tightly enough to stop all distal pulsation. A silk ligature was tied tightly proximal to the tumour (*Plate II*). After a period of anxiety both lower extremities were warm and there was apparently good circulation at the end of twenty-four hours. The patient was discharged from hospital five weeks after operation. The aneurysmal tumour gradually became smaller and at no time showed any evidence of pulsation. Three months later the patient was readmitted in a moribund condition as a result of intestinal obstruction. It was found at the post-mortem that this was due to a short band of adhesions between a loop of intestine and the anterior abdominal wall. The tumour was found to have diminished to a hard mass about the size of a small orange. The sac was completely obliterated (*Plate III*). The writer of this interesting record attributes great importance to the fact that there was practically no pulsation in the femoral arteries previous to operation. He regards this as an indication of the probable success of the operative procedure. The post-mortem examination revealed the fact that the fascia ligature subsequently relaxed and the silk ligature cut through. The fascia ligature was placed with the intention of saving the silk ligature from the full force of the pulsations.

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ANGINA PECTORIS AND CORONARY THROMBOSIS.

A. G. Gibson, M.D., F.R.C.P.

The subject of angina pectoris is receiving a considerable amount of attention from clinicians, and it is beginning to be possible to separate into etiological groups some of the various types of pain in the chest that are included under the term angina. We have gradually come to recognize the following groups:—

1. *Those cases following rheumatic carditis*, especially mitral stenosis.
2. *Those due to syphilitic aortitis*, whether with dilatation, aneurysm, or coronary stenosis.

3. *Those due to more or less sudden occlusion of one or both of the coronary arteries*, and producing, if the patient lives long enough, ischaemic necrosis and, ultimately, fibrosis of the cardiac muscle. Though these cases might be included under the term angina pectoris, if by that is meant cardiac pain, the clinical symptoms and the course of the disease are different from angina pectoris in the narrower and stricter sense. L. Wolff and P. D. White¹ analyse twenty-three cases verified by post-mortem. The typical attack is a sudden pain in the chest or upper abdomen, varying in type, with or without slight premonitory signs. It is not paroxysmal, but constant for hours or may be days; there is no relief from amyl nitrite and similar preparations, and morphia may be required in very large doses; this refractoriness of the pain is a most important symptom in recognizing the lesion during life. There is usually a sense of impending death. Dyspnoea is slight at first and later may usher in congestive cardiac failure. "The appearance of the patient is striking. . . . There is a peculiar ashen-grey colour of the skin, which is bathed in cold perspiration. Very rarely instead of pallor there is flushing. . . . The patient is restless, constantly changing his position in bed or tossing about incessantly. This is in striking contrast to the immobility during an attack of angina pectoris". The pulse may be irregular and may show one of the graver forms of arrhythmia such as pulsus alternans; yet all signs of heart disease may be absent. In less than twenty-four hours, however, signs are apparent in the heart; there is frequently some enlargement or a pericardial rub, but most certain of all is a steady fall in blood-pressure both in the maximum and minimum levels. There are changes also in the electrocardiogram, mainly in the T wave, which are known as bundle branch block. The outcome of such an attack may be death, congestive cardiac failure, or gradual recovery. A patient may suffer from recurrent attacks or be free for many years with a diminished cardiac reserve. It is important to realize that this is a lesion which heals up if the patient lives; he should have absolute rest in bed for at least four weeks, and the convalescence after that should last for several months. There is no need for cardiac tonics in the absence of signs of failure.

4. *Angina pectoris in the narrower meaning* is a paroxysmal substernal pain brought on by effort, digestion, emotion, cold, and other agencies. In an attack the patient is immobile and refuses to move, the face is pale, the pulse is hard, usually regular, and the blood-pressure is raised. Amyl nitrite relieves almost instantaneously, and the action of morphia is quick in the same direction. E. S. Kilgore² records a carefully studied group of 253 patients with angina and pseudo-angina of which 36 belonged to the group of true angina. In none of these was there pain on the right side; the greater majority complained either of a dull ache or compression sensation over the sternum or on the left side of the chest. In contrast to the other cases studied, pseudo-angina and cases with cardiovascular changes, lancinating pain in the attacks was only seen in four patients.

M. H. Kahn,³ in an analysis of 82 cases of angina for etiological factors, finds that in 25 per cent the first typical attack occurred before the age of 40. Twenty-nine per cent had suffered from frequent attacks of tonsillitis and 24 per cent had had acute articular rheumatism. John Hay⁴ has drawn attention to a milder variety of true angina, what he terms angina minor, excited and relieved in the same way, sometimes alternating with, and sometimes preceding for long periods, more violent attacks. The patients studied were all of middle age or older, and fall into the arteriosclerotic group of patients with or without raised blood-pressure. The condition appears to bear the same prognostic significance as those with major attacks, and the importance lies in the fact that it is only by very careful questioning that the real nature

of the pain can be determined. Many of these patients are labelled dyspeptics, because of the relation to digestion and the relief associated with the belching of wind previously swallowed.

M. H. Kahn,⁵ in discussing the *premonitory symptoms* of angina, mentions (a) attacks of epigastric 'pressing pain or epigastric burning sensation' (acute indigestion), (b) dyspnoea, palpitation, and fatigue on moderate exertion, and (c) cardiac asthma with pulsus alternans.

As Osler once said, the cardinal fact in the prognosis of angina is its uncertainty, and, as Heberden wrote, there are patients who have long periods of immunity and good health. The signs of gravity, according to Mackenzie, are "the ease with which the attack is provoked and the extent of the limitation of the response to effort". Other signs are pulsus alternans, nocturnal orthopnoea, Cheyne-Stokes respiration, and hypertension. To these may now be added coronary thrombosis, syphilis, poor heart-sounds, cardiac enlargement, and an abnormal T wave in the electrocardiogram. Much may be done to relieve the patient by adjusting his output of energy, be it muscular or mental, to what may be termed his cardiovascular income. "The ordinary high-pressure business or professional man may find relief or even cure in the simple process of slowing the engines, reducing the speed from the 25 knots of a *Lusitania* to the 10 knots of a black Bilbao tramp" (Osler). These aspects of the problem are well discussed by White.⁶

5. *Cases of thoracic pain of no grave cardiovascular significance*, especially those grouped under the term 'effort syndrome'. As E. S. Kilgore⁷ says, "One can be a good physician without knowing the theories of precordial pain, but he cannot, without grave injustice, undertake to advise a patient with such pain unless he is prepared to discriminate intelligently between angina and pseudo-angina; for a patient mistakenly diagnosed as having angina may suffer thereby as much as another with a very bad operative result at the hands of an incompetent surgeon". Pseudo-angina occurs in young persons and overworked women without any objective signs of cardiovascular disease and without any gross or persistent effects of exertion. There is frequently some remediable factor elsewhere, such as psychical trauma, the presence of sepsis, or disease in the chest. A small proportion of these cases are explained by the abuse of tobacco.

In a discussion at the Medical Society of London, J. Parkinson⁸ and A. J. Walton⁹ remarked on the *diagnosis of sternal pain* from the medical and surgical aspects respectively. The former thought it practical to group this symptom under sternal, left supramammary, and left submammary types. Pleuritic pain was likely to be lateral; tracheal, medial. If pain had a relation to effort it always meant serious cardiac disease; this type of pain was usually sternal. Submammary pain alone was practically indicative of angina. Of serious cardiovascular disease producing this type of pain there were four conditions: (1) syphilis of the heart or aorta, (2) atheroma of the coronary arteries, (3) coronary thrombosis, and (4) high blood-pressure. E. P. Poulton, in the discussion that followed, referred to the pain originating in the œsophagus in dyspeptic conditions, e.g., heartburn, which was relieved by peristalsis of the œsophagus. From the surgical standpoint Walton referred to carcinoma of the œsophagus, cardiospasm, gastric ulcer, acute dilatation of the stomach, visceroptosis, lesions of the pancreas and gall-bladder, and local lesions such as a tuberculous rib and spinal lesions, as being the more important conditions to bear in mind.

M. H. Kahn,¹⁰ investigating a series of cases of heart disease by means of digital pressure on the ribs and sternum, finds that *hyperæsthesias* of various spots are commonly associated with angina pectoris. Thus, of 55 cases of

angina pectoris in which this sign was carefully looked for, it was absent in but 7. The sign is not present in normal controls. The commoner spots are to the left of the mid-line over the 2nd, 3rd, 4th, and 5th ribs, especially the 3rd and 4th. To the right of the sternum it is most frequently found over the 3rd rib. The author finds that the presence of these spots is of great value in differentiating cardiac conditions from disorders of other viscera. The work is, however, incomplete, as in these cases there was no systematic investigation of Head's areas of superficial tenderness or of tender muscles.

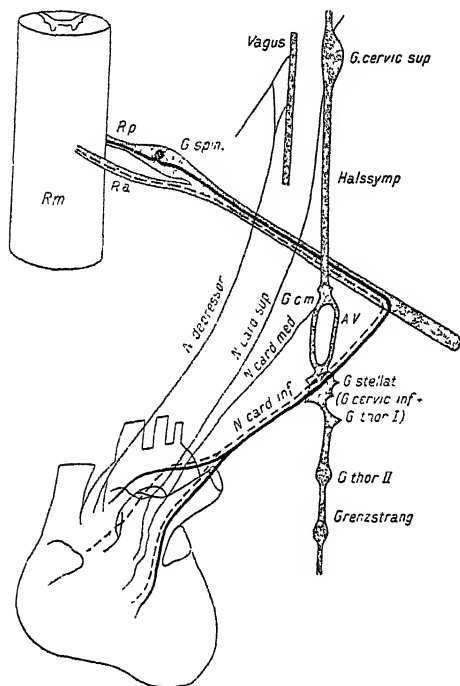


Fig. 5.—Diagram of the path of pain sensations (uninterrupted line) from the heart and aorta to the central nervous system. The efferent cardiac impulses travel by the interrupted line. J.V., Aorta of Viessens; G.c., Middle cervical ganglion; G. spin., Dorsal root ganglion; R.a., Anterior root; R.p., Posterior root; R.m., Spinal cord. For simplicity the path is represented as for one side only, though in reality the impulses travel to the cord on both sides by the posterior roots of the eighth cervical to the fourth dorsal inclusive. (Reproduced from the 'Wiener klinische Wochenschrift'.)

F. M. Smith, G. H. Miller, and V. C. Graber,¹¹ by a series of experiments on the coronary circulation of dogs, show that the rate of coronary circulation is closely related to the height of the diastolic pressure; clamping the aorta produces a great increase in the flow, while an arteriovenous aneurysm and aortic regurgitation produce a diminution in diastolic pressure and a diminution in coronary flow. It is suggested that cardiac hypertrophy and cardiac failure in aortic regurgitation and arteriovenous aneurysm may be in part produced by the deficiency in coronary circulation.

TREATMENT.—John Hay and Phoebe Ince,¹² following the success that was obtained first by Nagelschmidt in 1912 by the action of Diathermy on cases of intermittent claudication, have been applying the treatment in a series of cases of angina pectoris and hypertension. On the whole there has been a distinct improvement in the general condition of most of the patients. There was an increased sense of well-being, pain and dyspnea were much less readily induced, and a notable increase in the capacity for effort occurred.

No patient was harmed by the treatment, and the only unpleasant symptoms were dizziness, faintness, and excessive sweating.

W. Dock¹³ voices a plea for the trial in all cases of angina pectoris or intermittent claudication of Theobromine or Theobromine Salicylate before seeking the aid of surgery for sympathectomy. Theobromine is less irritable to the nervous system than caffeine or theophyllin; it comes second amongst these drugs as a vasodilator and diuretic. Unfortunately it is not possible to tell in

which case it will act, but when it does act the effect may be miraculous. In these cases a continuance of the drug is not always necessary.

Another paper by D. Daniélopou¹⁴ redescibes his method for the surgical relief of the pain in angina pectoris (see MEDICAL ANNUAL, 1927, p. 32). Incidentally he gives figures showing infiltration by inflammatory cells of the nerves and ganglia whose function it is to convey the pain sensations. Three of his sections are from the peri-aortic tissue, which brings us back to the aortic theory of the genesis of angina pectoris so strenuously upheld by the late Sir Clifford Allbutt.

Daniélopou¹⁵ reports another case in which considerable amelioration of the anginal pain occurred from his first operation (severance of the inferior cervical ganglion from the middle cervical ganglion and its connection with the spinal roots), which should carry a minimum of operative shock. This patient was given morphine and paravertebral novocainization. In reference to Daniélopou's contention that extirpation of the inferior cervical ganglion is dangerous and produces myocardial changes, W. Dock and H. Hartman¹⁶ confirm this effect in the rabbit.

E. Spiegel,¹⁷ in discussing from the anatomical and physiological standpoint the surgical relief of angina pectoris, concludes that the most direct way of interrupting the afferent nervous path from the heart, other than extirpation of the inferior cervical ganglion, would be to sever the posterior roots of the eighth cervical to the first dorsal nerves. He is of the opinion that section of other nerves, and especially of the afferent nerves to the cervical sympathetic, is not necessary. He gives a diagram of the path of pain sensations from the heart and aorta, which we reproduce (*Fig. 5*).

Paravertebral alcoholic block in cardiac pain is reported by G. I. Swetlow¹⁸ as being very successful in eight patients with angina pectoris. The freedom from pain following a single injection was secured in all cases and lasted several months. There were no complications and no serious after-effects.

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ANKYLOSIS OF THE HIP. (*See HIP-JOINT, SURGERY OF.*)

ANKYLOSTOMIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

A. C. Chandler¹ has recorded further extensive investigations carried out in the Calcutta School of Tropical Medicine in this disease. A study in Indian jails of the rate of loss of hookworms in the absence of re-infections showed this to be rapid, contrary to the belief of some workers, for carefully controlled experiments showed the loss of 50 per cent of the original infection in three months, 60 per cent in six months, and 70 per cent in one year, after which the rate of decline was much slower until one of 95 per cent was reached after eight years. Evidence was obtained pointing to this decline not being due to decreased egg output with increasing age of the worms, so he suggests that only a small percentage of worms which reach maturity settle in favourable localities in the intestine, or their habits make long life improbable. Thus, contrary to the views of Smilie, Chandler holds that hookworm infections are rapidly acquired and rapidly lost. Maskhar, in Madras jails, also found the infections rapidly decreased with the cessation of opportunities for re-infection.

A. C. Chandler and R. N. Chopra² have tested the effect of sugar, magnesium sulphate, sodium citrate, and dilute acids on the liver damage done by carbon tetrachloride in cats, who were found to be extremely susceptible to the action of the drug on the liver and kidney, and on dogs; they failed to reduce the toxicity with sugar, but magnesium sulphate reduced the deleterious action of the drug, and sodium citrate and sodium bicarbonate appeared to lessen the danger. Starvation before treatment and a fat diet should be avoided.

DISTRIBUTION.—Chandler next reports³ the methods used in a comprehensive inquiry into the incidence of hookworm in various parts of India by the examination of carefully preserved stools collected and sent to Calcutta for egg counts, together with local investigations. The incidence of infection was estimated by examining for the presence of hookworm ova by Clayton Lane's D.C.F. method by means of electrically driven centrifuges improved in some respects in Calcutta. In his next paper⁴ he reports the results of such an inquiry in the damp, hot, water-logged area of Eastern Bengal, which has high humidity all the year, so that only a slight slowing of development of hookworms occurs during the cool nights of December to February. Yet the degree of infection is very light in nearly all the area, with indices of 60 to 65, which is attributable to the extensive use of primitive log or bamboo latrines, which prevents the females more especially from getting their feet infected through contact with infested soil. It is only in the northern Mymensingh and the eastern Chittagong districts, without such latrines, that the hookworm incidence is higher, with an index of infection of 156. The use of this type of latrines should therefore be encouraged. Chandler⁵ has also recorded the results of nine more inquiries into the prevalence of hookworms in different parts of India.

This valuable series of papers brings out very clearly the close relationship between climate and hookworm incidence, and also shows that the amount of actual disease produced by them is negligible over very large areas of India on account of the long periods of dry and hot weather, and that in only limited areas is the degree of infection such as to require active measures to combat it. In Madras it has even been established that many of the Indian emigrants develop increased infection while working in tropical areas abroad, and lose it again on returning to their native country.

V. T. Korke⁶ has also studied hookworm prevalence in some Bihar jails, with very similar results to those of Chandler. D. M. Chatterji⁷ examined the stools of 371 surgical cases in a Calcutta hospital and found hookworm ova in 11.6 per cent, but the degree of infection is not noted. [The reviewer washed the stools and counted the worms in many hundred post-mortems in the course of twenty years at the Calcutta Medical College Hospital, and found hookworms present in about 70 per cent, but in the great majority they were in the negligible numbers of less than 10 per case, and in extremely few were over 50 found, so the infections were very light.—L. R.]

Papers on the prevalence of hookworms have also been contributed by W. E. McCulloch⁸ (North Nigeria), D. S. Davies⁹ (Dongola), J. F. C. Haslam¹⁰ (Pomeroon district of British Guiana), and W. O. Fischer¹¹ (gold mines of South Africa).

C. W. Stiles¹² discusses the classification of hookworm infections (*see* MEDICAL ANNUAL, 1927, p. 35), and disagrees with the view that light infestations do not require treatment. G. M. Heydon,¹³ working in Queensland, describes the differences between the fully developed larvæ of *Necator americanus* and *Ankylostoma duodenale* respectively as seen in cultures of stools by Baermann's method, and finds that they can be differentiated most easily by the fact that in necators the distance between the end of the œsophageal bulb and the genital rudiment is less than half that from the former point to the anus, but

in ankylostomes it is more than half that distance. By this means the type present in the patients can be ascertained before treatment by culturing his stools, and the drug having most effect on the type found can be used. In Queensland each type often has a local distribution.

TREATMENT.—C. A. Lane¹⁴ regards the now very generally employed **Carbon Tetrachloride** as less efficient in safe doses than former remedies, and he also finds **Beta-naphthol** dangerous. His choice is between **Thymol** and **Oil of Chenopodium** of known ascaridol content. He thinks a combination of **Ascaridol with Carbon Tetrachloride** in small safe doses worthy of carefully controlled trial. C. Manalang¹⁵ discusses the same problem in the light of his treatment in the Philippines of 1300 hospital cases, and his results show the relative inferiority of the oil of chenopodium. E. M. Rice¹⁶ reports on mass treatment of hookworm infections on tea estates, and he found 60-min. doses of carbon tetrachloride in 1 oz. of saturated magnesium sulphate after a morning meal, in those from 18 to 50 years of age, a safe and efficient remedy, even in pregnant women. The only precaution was to forbid alcohol for one day before and after the treatment, and by this simple method heavy infections were reduced to harmless ones, and the number of infections could be materially reduced. M. C. Hall and J. E. Shillinger¹⁷ have tried in dogs Rivas's suggestion of intestinal lavage with water at high temperatures as an anthelmintic, but found it both ineffective and dangerous, as it frequently killed the animals without removing all the worms, so he advises great caution in applying it to man.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1926, Jan., 625; ²*Ibid.* July, 219; ³*Ibid.* 185; ⁴*Ibid.* 195; ⁵*Ibid.* Oct., 451, 481, 493, and 1927, Jan., 733, 745, and 761, April, 955, July, 143, 159; ⁶*Ibid.* 1926, Oct., 383; ⁷*Ind. Med. Gaz.* 1927, May, 252; ⁸*Jour. Trop. Med. and Hygiene*, 1927, May 2, 117; ⁹*Trans. Roy. Soc. Trop. Med. and Hygiene*, 1927, March, 436; ¹⁰*Ibid.* Jan., 354; ¹¹*Jour. Med. Assoc. S. Africa*, 1927, April 9, 138; ¹²*Jour. Amer. Med. Assoc.* 1927, Feb. 12, 455; ¹³*Med. Jour. of Australia*, 1927, April 9, 531; ¹⁴*Lancet*, 1927, II, 346; ¹⁵*Amer. Jour. Trop. Med.* 1927, Jan., 57; ¹⁶*Ind. Med. Gaz.* 1927, March, 125; ¹⁷*Amer. Jour. Trop. Med.* 1926, Sept., 341.

ANTE-NATAL CARE.

Beckwith Whitehouse, M.S., F.R.C.S.

"The birth-rate in England and Wales", states the Registrar General in his statistical review for 1926, "has now fallen below that of France, and, with the exception of Sweden, is the lowest of the principal European countries. With the exception of the year 1918, 1926 recorded the lowest birth-rate since the establishment of civil registration in this country, namely 17·8 per 1000 population". In the light of these serious facts, with the possible menace of racial suicide, the care of the expectant mother assumes a new importance, and if possible an even greater importance than before. The responsibility of the practitioner faced with the every-day problems associated with the ante-natal clinic is by no means small. Not only must he be prepared to recognize, investigate, and treat the various complications and risks incidental to the pregnant state. He also has a responsibility to the unborn child, and his duties are not completed until that child has made a safe transit through the parturient canal, and the mother is wholly and completely restored to a normal state of well-being, able to take her place in the life and activities of the community.

It may be asked therefore, At what stage in pregnancy should these responsibilities be assumed? The reply is that ante-natal care cannot be exercised too early, and women should be encouraged to report at once to their medical adviser the moment they know themselves to be pregnant. Patients not infrequently think it quite unnecessary to mention the possible existence of a pregnancy until the twelfth or sixteenth week of amenorrhœa, unless any

nupleaseant symptoms should arise. There are, however, certain dangers attached to the early months of gestation which it is important to remember. One is the risk of abortion. The frequency of abortion is difficult to estimate. It is not notifiable, and therefore no very definite statistics are available. The fact remains, however, that premature expulsion of the fertilized ovum is a very common occurrence and there is a very large wastage in this respect. In another section (*see STERILITY*) we have referred to the biological evidence put forward by Professor Arthur Robinson indicating that the cause of some abortions probably lies in an inherent lack of vitality of the fertilized ovum. The product of conception dies in utero, and unless retained as a carneous mole is expelled as a foreign body. With our present knowledge it is not possible in many cases to prevent abortion due to this cause. Attempts based upon comparative physiology are, however, being made to increase the vitality of the ovum by the addition to the diet during pregnancy of an increased quantity of **Vitamin E**, the recently discovered reproductive vitamin. **Calcium** also appears to be of vital importance to the developing ovum, and, if evidence of calcium deficiency be present, the want should be made good and maintained during the pregnancy by the administration of the element, either in the colloidal form or as the lactate.

Recently we have suggested that premature degeneration of the corpus luteum from various pathological processes in the ovaries may be the cause of certain cases of abortion. Fraenkel in 1903 and 1910 first drew attention to the fact that destruction of the corpus luteum usually produced abortion. It is only recently, however, that preparations of **Ovarian Hormone** have been used in an attempt to prevent habitual abortion without obvious physical signs. **Thyroid**, by stimulating ovarian activity, may act in a similar manner.

The *mechanical causes* of abortion which are of importance to the practitioner are displacements of the uterus, and the effects of coitus. Premature expulsion of the ovum is not infrequently Nature's reply to a neglected retroversion or retroflexion of the uterus. Many causes of backward displacement undoubtedly correct themselves, but the existence of a displacement should certainly be known in case intervention may be required. If, at the end of the eighth week of gestation, retroflexion or retroversion of the pregnant uterus persists, it should be replaced and a suitable support introduced for the following four weeks. Coitus as a cause of abortion is not sufficiently recognized or emphasized. That it is important is evident from statements commonly made by patients when information on the point is directly invited. Women should therefore be warned of the risks to the ovum associated with local trauma during the early months of gestation. Once placentation is complete, the danger of premature detachment from this cause does not appear to be so great.

A very excellent definition of the modern conception of ante-natal care is that put forward by Watson. "Ante-natal care", he says, "implies a thorough general examination of the patient as early in pregnancy as possible, and a special examination to make sure that she has the physical configuration necessary to normal labour. It implies a careful watch on the patient at regular intervals throughout the pregnancy, and the immediate institution of appropriate treatment whenever the least departure from the normal is detected". Perhaps the most important word in the whole of this exposition is the word "immediate". The immediate detection, and in many cases the immediate correction, of any deviation from the normal, goes a long way towards removing most of the difficulties and dangers associated with pregnancy, labour, and the puerperium. This is well exemplified in the case of the results of pregnancy toxæmia, whether the clinical picture be that of toxæmic vomiting or impaired

renal function. Professor Hendry, of Toronto, recently called attention to the importance of early treatment in *pernicious vomiting*. In a series of 40 severe cases, 34 recovered and the pregnancy continued to term. In 6, therapeutic abortion had to be performed, and it is significant that all the 6 failures were patients in whom vomiting had persisted for four weeks or more before admission to the hospital. Hendry considers that dehydration plays a most important part in hyperemesis gravidarum, and treatment is accordingly directed to correct this deficiency. An intravenous injection of 1000 c.c. of 5 per cent **Glucose** solution in normal saline is given daily until the daily volume of urine excreted reaches 40 oz. (1000 c.c.). Rectal enemata of 200 c.c. (8 oz.) of 10 per cent solution of glucose in normal saline are also given four times daily, 30 to 40 gr. of **Sodium Bromide** being added for the first day or two to the nightly enema. No solids are given by mouth, but the patient is encouraged to drink as much fluid as she can, even if she is vomiting freely. The daily intake and output of fluids are carefully measured, and when, in a few days, the vomiting lessens and the patient begins to feel hungry, she is given small quantities of food such as toast, jam, marmalade, baked apple, stewed fruits, and baked potatoes. If the solids are well borne, the variety is increased by the addition of chicken, fish, and vegetable broths. Fats, including milk and butter, are studiously avoided, and after the patient has left hospital she is advised to drink at least a quart and a half of fluid daily. Intensive treatment is not continued for longer than a week or ten days. If at the end of this period the daily output of urine with a specific gravity of 1010 has not increased to 40 oz., the pulse-rate is rising, the tongue is dry, and the blood-pressure falling, then the pregnancy should be terminated without delay.

Too much emphasis cannot be laid upon the early recognition of *toxæmia* in the pregnant woman. After sepsis, the various forms of toxæmia account for the highest number of deaths during pregnancy or the puerperium, and amount to about one-fifth of the total. Efficient care of the expectant mother will prevent this mortality, for the early recognition of albuminuria is an obvious warning of impending danger. Dr. Janet Campbell, in her report on maternal and fetal mortality in England and Wales, when discussing this matter states that "the impression is gained from the fatal cases especially investigated that there was usually no ante-natal care, often because the patient failed to seek advice for obvious symptoms, and that even when given, the supervision and treatment were apt to be incomplete and ineffective". Hospital experience commonly confirms this impression. The authors of the recently published *Queen Charlotte's Practice of Obstetrics* observe that "nearly every case of eclampsia admitted to Queen Charlotte's Hospital has either not had the urine tested, or possibly only once some weeks or months before. It is very rare for a patient who has regularly attended the hospital ante-natal clinic to develop eclampsia, because every patient is seen at frequent intervals, when the urine is tested as a routine part of the examination". The moment any albumin is detected the woman is admitted to hospital and submitted to a rigid antitoxæmic régime.

The difficulty of carrying out efficient treatment—and by this is meant **Absolute Rest on a Water Diet**—in the houses of the people is considerable, and we think that this factor is also influential in establishing such a marked difference between hospital and private patients with regard to the end-results of pregnancy toxæmia. The public will not or cannot recognize the importance of the word 'bed', 'all bed', and 'nothing but bed'. Neither will they understand that even a milk diet is associated with certain dangers to the toxæmic patient. Starvation is a more terrible spectre to the lay mind than toxæmia,

and in this respect the expectant mother, her friends, and her relations have to be educated.

During the later months of pregnancy, and especially during the last four weeks, the responsibilities of ante-natal work increase. The mortality associated with difficult labour results from either sepsis, shock, or hæmorrhage, and therefore the prevention of *mechanical difficulties* is and must be the chief concern of the practitioner or midwife at this stage. The recognition of contraction not only at the 'inlet' but also at the 'outlet' of the pelvis, the timely induction of labour in cases of slight disproportion, the correction of shoulder and breech presentations, will all diminish the risk of obstetrical disasters. In other words, when the first labour pain is felt the accoucheur should be in a position to assure all concerned, *himself included*, that every reasonable precaution has been taken. Unfortunately the mortality of childbirth is unreasonably high to-day. It is too high in all countries, and, as Sir George Newman points out, "the child-bearing mother is not sharing equally with the rest of the population in the improved public health".

On several occasions we have drawn attention to the advantages that might result from a *closer association between the midwife and the general practitioner*. Co-operation, not rivalry, is needed. Not uncommonly we fear that the difficult doctor's case is a 'failed midwife case', just as the hospital patient is frequently the 'failed forceps' case. About 560 ante-natal centres already exist in this country. This is a start, but more are required. At the same time the 'clinic' movement cannot remove the responsibilities of the practitioner in this matter. There are many patients who have not visited, and never will visit, a public institution during their pregnancy. They have the right, and they prefer, to place the care of their own lives and the lives of their children in the hands of the family practitioner or the trained midwife. Closer co-operation between the medical profession and the midwives would, we think, prevent some of the difficulties which are still all too frequent during the actual course of labour. The training of midwives has improved considerably within recent years, especially from the practical standpoint, and the larger number of labours may be properly attended by them. In matters of fine diagnosis, however, the training and experience of a qualified medical practitioner are assets in ante-natal care which cannot be neglected. If therefore every pregnant woman could be examined at least once by a doctor during the last four weeks of pregnancy, there is good reason to believe that some of the difficulties attributable to the 'failed midwife case' would be eliminated. Co-ordination would probably result in an exchange of patients. A certain number of normal uncomplicated confinements could be handed over to the care of midwives in return for cases taken out of their hands where possible difficulty was anticipated. Much could be done in this direction by doctors and midwives putting their heads together. There is a place in the community for the services of both, and by mutual co-operation the expectant mother must benefit, to say nothing of the saving of time to the doctor!

ANUS, IMPERFORATE.

J. P. Lockhart-Mummery, F.R.C.S.

Seth Fitchet¹ gives a description of 31 cases occurring in the Massachusetts General Hospital during fifty-two years. The death-rate was over 50 per cent. This high mortality he shows is largely explained by failure to recognize the condition soon enough, and to too prolonged procedures for its relief. The highest mortality was in the cases of imperforate anus and absence of the rectum. Two cases of this condition are given which were successfully operated upon by opening up the perineum and bringing down the distended gut: both children were operated upon within twenty-four hours of birth. The author

rightly points out the advisability of operating from the perineum, as the mortality from laparotomy at this tender age is very high. (*Fig. 6.*)

Lockhart-Mummery² records two cases of girls, one 9 and one 14 years old, operated on for imperforate anus. In both cases the rectum opened in the upper part of the posterior vaginal wall. Operation was undertaken in order to try and render these girls normal individuals and to improve their control

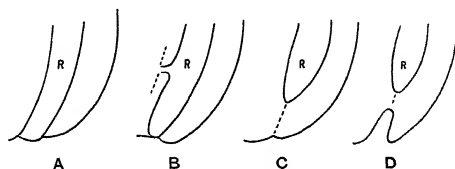


Fig. 6.—Illustrating Fitchet's paper on imperforate anus. A, Imperforate anus; B, Imperforate anus and urethral or vaginal fistula; C, Absence of part or whole of rectum; D, Normal anus, absence of part of rectum. (*Re-drawn from the 'Journal of the American Medical Association'.*)

over their evacuations. The rectum in both cases was dissected out from the vagina, and, after being freed, transplanted into its normal position, the posterior vaginal wall being afterwards restored and the perineum stitched up. The operations were completely successful, and very considerable improvement in control was secured, besides rendering the girls normal as regards the genital passage.

REFERENCES.—¹*Boston Med. and Surg. Jour.* 1926, July 1, 25; ²*Proc. Roy. Soc. Med.* (Clin. Sect.), 1927, Oct.

APPENDICITIS. (*See also* INTESTINES, SURGERY OF.)

A. Rendle Short, M.D., F.R.C.S.

Rigors in Appendicitis.—R. Colp¹ submits a study of 2841 cases of acute appendicitis treated at the Mount Sinai Hospital, with special reference to the occurrence of rigors, or 'chills' as the Americans call them. These were recorded in between 6 and 7 per cent of the total number of cases, and were evenly distributed amongst the patients with catarrhal appendicitis, gangrene, abscess formation, and peritonitis. A single rigor at the beginning of an attack did not alter the prognosis materially. The combined mortality of cases with rigor was 6 per cent, of cases without rigor 5.1 per cent. Seventy per cent of all rigors occurred within twenty-four hours. A single rigor is not infrequently seen on the third day, associated with the advent of abscess formation or widespread peritonitis. Multiple rigors, especially if they are seen after operation, are of much more serious import, and may signify the presence of portal pyæmia, which is usually fatal. It followed in 9 cases, or 0.3 per cent of the total number. On 3 occasions Colp² ligatured the portal vein for this condition, but all were unsuccessful.

Traumatic Appendicitis.—Questions occasionally arise in the courts of law whether appendicitis can be due to a blow. The subject is discussed by R. J. Behan.³ He quotes Moorehead in his book on *Traumatic Surgery* as saying: "It seems highly improbable that any sort of violence could produce a lesion of such a deep-seated, movable, and well-protected tiny piece of intestine as is the appendix, and yet do no damage to surrounding intestine." Behan suggests, however, that sudden pressure may force gas into the lumen and distend it, and so start an inflammatory process, especially if a concretion or kink is present. He reports a case in which the symptoms became definitely those of appendicitis three weeks after a blow on the left side of the abdomen; abdominal pain had been present all the time. He quotes about a dozen of cases of appendicitis alleged to be due to trauma.

[The reviewer has seen three cases which might be classified as traumatic appendicitis. The first was a child struck over the right iliac fossa and seen that day for pain and tenderness. Unfortunately the temperature was not taken. Three days later the child was admitted to hospital with perforation of the appendix and peritonitis, and died. The second, many years after, was also a child with pain and tenderness after a blow over the appendix; the temperature was raised, and the inflamed appendix was successfully removed. The third case quite recently came into the courts. A man was struck at his work, and immediately collapsed. Twelve hours later the abdomen was found to be full of peritonitis, with a perforated appendix. He died, and the widow claimed and obtained compensation from the employer. It seems probable that he went to work with a smouldering appendicitis, and the blow either burst the appendix or disseminated the pus. We think that the case for traumatic appendicitis must be regarded as 'not proven'. Appendicitis is common; blows on the abdomen are common; the public love to find a tangible cause for every illness. Mere coincidence will bring it about occasionally that a person shall strike his abdomen and commence an attack of appendicitis on or about the same time. The moral is—in every case of a blow over the appendix followed by tenderness, take the temperature.—A. R. S.]

The Mortality in Acute Appendicitis.—Several papers deal with this subject. J. B. Hunter,⁴ late registrar at University College Hospital, quotes the Registrar-General's figures for deaths from appendicitis for England and Wales (which we reproduce in part):—

		MALE	FEMALE	TOTALS
1915	..	1441	1062	2503
1920	..	1389	1142	2531
1925	..	1624	1238	2862

He then gives the death-rate at his hospital for the years 1921–25. There were 602 cases; 274 were closed and 328 drained; 21 died (3·5 per cent). The practice at this hospital is to operate on every case as an emergency, irrespective of the stage of the disease, abscess formation, etc. As he points out, the figures compare favourably with those of the London Hospital and St. Thomas's, where third- and fourth-day cases are often treated medically.

A. P. C. Ashhurst,⁵ of Philadelphia, gives his personal figures for cases that were severe enough to require drainage:—

247 COMPLICATED CASES OF APPENDICITIS (TO OCT. 1, 1926).

DESCRIPTION OF CASES	TOTAL CASES	RECOVERED	DIED	MORTALITY PER CENT
<i>Operation on Admission to Hospital.</i>				
Primary abscess	98	90	8	8·1
Gangrene	44	42	2	4·5
Diffuse peritonitis	68	57	11	16·1
	210	189	21	10·0
<i>Delayed Operation (Cases of Diffuse Peritonitis).</i>				
Died without operation	6	0	6	100·0
Abscess drained, appendix not removed ..	20	13	7	35·0
Abscess drained, appendix removed ..	11	11	0	—
	37	24	13	35·0
Combined totals ..	247	213	34	13·7

It is his practice to delay operation on patients with diffuse peritonitis if they look toxic, and to treat them by the strict Ochsner method.

Le Grand Guerry,⁶ of Columbia, states that in the year 1925 there were probably 500,000 cases of appendicitis in the United States and Canada, of which 25,000 died. The death-rate per 100,000 living has increased from 11 in 1920 to 14.4 in 1925. He presents a study of 2959 cases, which resulted as follows:—

DEATH-RATE IN 2959 CASES AS ANALYSED BY GUERRY.

DESCRIPTION OF CASES	NO OF CASES	NO. OF DEATHS	MORTALITY
Chronic appendicitis	1241	0	0.00
Acute appendicitis	688	1	0.15
Gangrenous, ruptured, localized abscess	570	4	0.70
Acute diffuse peritonitis	85	7	8.20
Cases in extremis, abscess drained, appendix not removed	9	3	33.33
Total..	2593	15	0.58

The mortality for the 1352 cases of acute appendicitis was 1.1 per cent, or, leaving out the undrained cases, 664 with pus or peritonitis, with a death-rate of 2.1. There were 123 patients with diffuse peritonitis in whom operation was deferred until they had had a course of Ochsner treatment. Two of these died, i.e., 1.6 per cent. These 123 cases are included in the 570 with localized abscess. These figures are certainly very satisfactory, and we must allow due weight to them in favour of the author's thesis that it is better to defer operation in patients with diffuse peritonitis. A drawback of this method, in the reviewer's experience, is that the delayed operation is apt to be very difficult, and it may be wiser to leave the appendix *in situ*. Probably this difficulty could be overcome by a yet longer wait in some cases, but most of us in hospital practice are faced by a famine of beds.

REFERENCES.—¹*Ann. of Surg.* 1927, Feb., 257; ²*Surg. Gynecol. and Obst.* 1926, Nov., 627; ³*Ann. of Surg.* 1927, Feb., 263; ⁴*Brit. Med. Jour.* 1927, 1, 508; ⁵*Ann. of Surg.* 1927, Jan., 89; ⁶*Ibid.* 1926, Aug., 283.

APPENDICITIS IN CHILDREN.

John Fraser, Ch.M., F.R.C.S.Ed.

Hernia Appendicitis in Infants.—An unusual aspect of appendicitis is presented by Mario Melletti.¹ The clinical history is given in detail of a baby fifty-two days old who had suffered since birth from a right scrotal hernia. With comparative suddenness the scrotal swelling increased in size and tenderness became evident; there were also some rise of temperature and signs of general illness. On the first examination the condition was thought to proceed from an irreducibility of the contents, and an attempt was made to reduce, with partial success. On the following day it was evident that peritonitis was in progress, and operation revealed that the hernia sac contained an inflamed appendix, gangrenous and perforated at its tip. This case is cited as an indication of the care one should exercise in the investigation of an unusual hernia condition in an infant, and reference is made to a large number of similar cases recorded in the literature.

REFERENCE.—¹*Policlinico* (Sez. Chir.), 1927, June, 280.

ARRHYTHMIA AND CARDIOGRAPHIC CHANGES. (See also HEART DISEASE.)

A. G. Gibson, M.D., F.R.C.P.

J. H. P. Paton¹ has studied *sinus arrhythmia* in a series of 500 girls of the school age 8–18. He found it present in 496, and in the remaining 4 it was absent because of febrile disease. He therefore looks upon the presence of

sinus arrhythmia as an indication of health, and its absence as meaning some deviation from it. The method used by the author for its detection is to note the effect of deep breathing.

H. L. Otto and H. Gold² have made a study of 12 cases of various etiology showing *persistent extra-systoles*, with special reference to the factors which diminish or increase them. No patient was considered suitable for study unless the premature contractions remained over a period of at least one month while under observation. All cases were confined to bed and were studied as to the number of premature contractions and their relation to the normal beats, the place of origin in the heart, their constancy, and the heart-rate. The results were that rest in bed and atropine had no effect; exercise and adrenalin increased the number of premature beats; quinine, quinidine, and digitalis diminished them. In a proportion of cases, tea, coffee, and tobacco tended to increase the contractions; in other cases there was no effect. Quinine and quinidine are of less value than digitalis in diminishing the contractions, except with large doses, and the authors make the suggestion that to abolish persistent extra-systoles it is mainly a question what is the right dose of digitalis.

Geoffrey Bourne³ analyses certain conditions causing a variation in the number of extra-systoles in 28 cases in which they were a constant phenomenon. The cases include normal (7), rheumatic without failure (3), rheumatic with failure (5), syphilis (1), arteriosclerosis without failure (5), with failure (6). Exercise diminishes or does not affect the number of premature beats in normal and in rheumatic cases; it increases the number in patients with evidence of arteriosclerosis or of coronary disease. Amyl nitrite acts similarly but is less clear-cut. Standing also increases the number of premature beats. Atropine during its earlier and later stages causes a diminution quite irrespective of the type of case. In three cases *pulsus alternans* was rendered more marked after exercise; the number of premature beats showed an increase at the same time.

H. W. Jones⁴ has analysed 870 cases attending the Heart Department of the Royal Infirmary, Liverpool, in an attempt to ascertain the prognosis in *auricular fibrillation*. His conclusions are that an onset with symptoms or with distress is more serious than one without; an exception to this is when the change is to a slow fibrillation, a change which is seldom accompanied by marked symptoms. Other serious indications are a poor response to effort, marked cardiac enlargement, the presence of marked valvular defect, and a poor response to treatment. The outlook is more serious in the senile than in the rheumatic group; length of life in mitral stenosis is little affected. The onset of auricular fibrillation has a good effect in aortic regurgitation. Females have a better expectation of life than males.

Auricular fibrillation with a regular rhythm of the heart was first described in 1911 by Mackenzie, who recorded a case in which the heart-rate fell from 110 to 70 and assumed a regular rhythm. The absence of the auricular wave in the jugular pulse persisted, and an electrocardiograph confirmed the presence of fibrillation. R. L. Levy⁵ reports 4 cases in which the ventricular rhythm showed periods of regularity with a ventricular rate of over 60 per minute. He finds 15 similar cases in literature with a ventricular rate of over 55. This regular rhythm may last from a few hours to several days.

J. Hay and H. W. Jones⁶ consider an important medico-legal point touching auricular fibrillation. Emanuel, in his Ingleby Lectures in 1925, referred to 17 cases of this irregularity that were reasonably due to *physical exertion*, and to another that was due to an *electric shock*. Other cases of spontaneous auricular fibrillation have been observed. The 5 new cases here recorded are a very strong argument that auricular fibrillation is the result of strain of the heart muscle, and that it may occur not only when the heart has been

previously diseased, and in older persons, but also in the physically sound. One clear case of it following an electric shock is recorded.

Paroxysmal tachycardia is dealt with by W. T. Ritchie⁷ in an able summary of the disorder, and the treatment by S. A. Levine and H. Blotner.⁸ Of Levine and Blotner's 138 cases, 18 per cent were of the auricular type, 40 per cent of the nodal, 18 per cent undetermined supraventricular type, and 33 per cent ventricular. Of Ritchie's 14 cases, 1 was auricular, 1 nodal, 8 ventricular, and 4 undetermined. The intensity of the symptoms is much more marked in ventricular tachycardia than in the auricular or nodal form, and may be the immediate cause of the patient's death. It is necessary to mention that this subdivision depends on the site of origin of the abnormal frequently-recurring stimulus, and that the identification of these subdivisions can only be made by the electrocardiograph (*Figs. 7, 8, 9*). The arrest of the

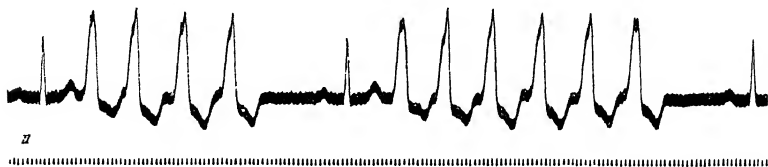


Fig. 7.—Ventricular paroxysmal tachycardia. Two brief paroxysms at a rate of 142.8 per minute. (*Figs. 7-9 reproduced by kind permission from the 'Edinburgh Medical Journal'.*)

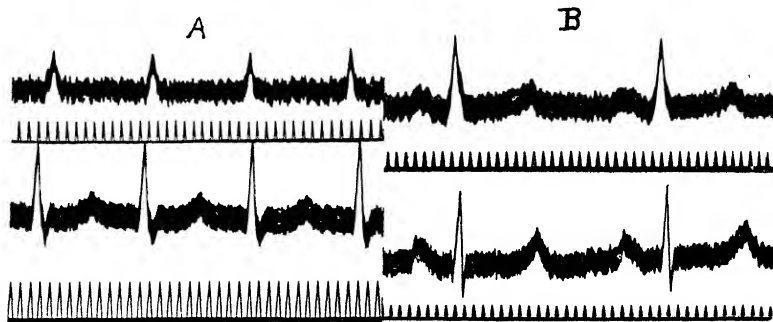


Fig. 8.—Auricular paroxysmal tachycardia. A, Electrocardiograms by Leads I, II, and III during a paroxysm at the rate of 160 per minute; B, Between the paroxysms.



Fig. 9.—Nodal paroxysmal tachycardia. The first beat is a normal one; the next five beats form a brief paroxysm of nodal origin. At the end of the record the post-paroxysmal pause is followed by a normal beat.

paroxysm is successful only in the auricular type by some method of stimulating the vagus such as compression of the nerve in the neck. Deep breathing, holding the breath, drinking cold water, or Valsalva's experiment may be successful. For the general effect on the paroxysm, Ritchie's view is that the *Digitalis* group is useless and may be dangerous, whereas Levine and Blotner report three cases of auricular paroxysmal tachycardia in which digitalis in full doses prevented attacks in each case for several months. These authors have not been successful with quinidine sulphate. The indications for treatment in these cases are not clear, and further work must be awaited.

Ritchie thus sums up the clinical diagnosis: "The sudden onset of palpitation with an arterial pulse-rate of 140 or more always suggests the possibility of paroxysmal tachycardia. If the rhythm of the arterial pulse, and of the ventricles as ascertained by auscultation, is wholly irregular, the condition is almost certainly that of paroxysmal auricular fibrillation. . . . If the ventricular rhythm be regular, however, the possibility of auricular flutter has to be borne in mind. In auricular flutter the auricular rate is usually 250 to 300 and the ventricular rate 140 to 150, the auriculo-ventricular ratio being 2 : 1. A ventricular rate exceeding 150 is therefore more likely to indicate paroxysmal tachycardia than auricular flutter. . . . In auricular flutter the jugular veins are not so greatly distended, nor do they pulsate so forcibly as in paroxysmal tachycardia. . . . If vagal compression causes transient slowing of the ventricles, and if this effect passes off rapidly after the vagal compression is relaxed, we may be certain that we are dealing with a case of auricular flutter. If vagal compression causes the ventricular rate to fall suddenly to normal . . . and the latter rate is maintained after withdrawal of pressure from the vagus, the attack was undoubtedly one of auricular paroxysmal tachycardia". In nodal and ventricular forms of paroxysmal tachycardia the ventricular rate is not influenced by vagal compression.

On the subject of *heart-block*, S. Hyman⁹ describes three cases showing various degrees which followed attacks of mild influenza. Block of a small degree is not infrequently seen. Block of the second degree with ventricular intermissions may follow a trivial attack of influenza. The effect is worse in a heart already damaged. Cases suspected of suffering from myocardial damage after influenza should all be examined by the electrocardiograph. S. A. Levine¹⁰ reaffirms the value of *Adrenalin* in the syncope of heart-block, and recommends the injection direct into the heart muscle.

P. Barlow¹¹ describes four cases of sino-auricular block, and gives a tabular summary of the published cases since 1916. The term is applied to cardiac

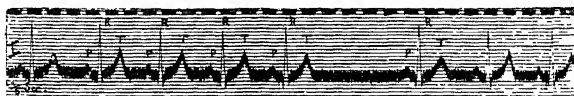


Fig. 10.—Sino-auricular block. The pause, which measures nearly two normal cycles, is not preceded by any quickening of the heart, though the cycle immediately succeeding the intermission is longer than normal. (By kind permission of the 'Lancet', and of Dr. John Parkinson, from whose electrocardiogram the block was taken.)

intermissions in which by graphic methods no evidence occurs of any cardiac activity whatever over a period of roughly two full cardiac beats in which there is no extra-systole (Fig. 10). There is no clear experimental evidence that the name expresses what happens; it may be temporary failure in excitability or of contractility of the pace-maker, for except in amphibians sino-auricular block is experimentally difficult or impossible. Under this term,

however, a series of cases with this irregularity has now been described. It is very rare; it causes no characteristic symptoms, and it is usually abolished by atropine and aggravated by pressure on the vagus. It is not associated with any symptoms or signs of cardiovascular disease. Etiologically it is most frequently seen in association with the administration of digitalis, and it is frequently found in association with auriculo-ventricular block.

D. Scherf¹² recommends the investigation of cardiac cases showing arrhythmia by observing the effect of amyl nitrite, which gives a diminution of vagal tonus, an increase of sympathetic tonus, and an increase in the coronary circulation. In some cases extra-systoles disappear; in others, in which they may be temporarily absent, they reappear. Continuous bigeminy and sinus arrhythmia have disappeared in the cases observed. Its action on disturbances of conduction is variable, sometimes causing a lessening and sometimes an increase in the blockage. Auricular flutter is not altered.

Hyman and Fisher¹³ report a case in which a stab wound had injured the wall but had not penetrated the cavity of the left ventricle, and which was sutured with silk. Eight months after the injury the electrocardiogram showed an inversion of the T wave in the first lead only. Though the injury was in the left ventricle, extra-systoles arising in the right ventricle were observed.

REFERENCES.—¹*Edin. Med. Jour.* 1927, Jan., 1; ²*Arch. of Internal Med.* 1926, Aug., 186; ³*Quart. Jour. Med.* 1927, April, 219; ⁴*Lancet*, 1926, II, 640; ⁵*Arch. of Internal Med.* 1926, July, 116; ⁶*Brit. Med. Jour.* 1927, I, 559; ⁷*Edin. Med. Jour.* 1926, 193; ⁸*Amer. Jour. Med. Sci.* 1926, Nov., 660; ⁹*Med. Jour. and Record*, 1926, Dec. 1, 698; ¹⁰*Boston Med. and Surg. Jour.* 1926, Dec. 16, 1147; ¹¹*Lancet*, 1927, I, 65; ¹²*Wien. klin. Woch.* 1927, Jan. 27, 113; ¹³*Amer. Heart Jour.* (abstr. *Jour. Amer. Med. Assoc.*, 1927, Jan. 15, 119).

ARTHRITIS.

Ivor J. Davies, M.D.

A. H. Todd,¹ in a Hunterian Lecture on *syphilitic arthritis*, adopts D'Arcy Power's classification of the joint affection:—

Secondary Syphilis	{	Arthralgia	{	Intermittent
		Synovitis		Chronic
Tertiary Syphilis	{	Gummatous synovitis	{	
		Chondro-arthritis, ulcerating, or Virchow's joints		
		Tabetic, sclerosing, or Charcot's joints.		
Congenital Syphilis	{	Suppurative arthritis	{	
		Hydrarthrosis		
		Symmetrical serous synovitis, or Clutton's joints		
		Gummatous synovitis		
		Chondro-arthritis, ulcerating, or van Gies' joints		

He concludes: (1) Syphilitic arthritis is not nearly as uncommon as it is commonly thought to be. (2) There are many forms of syphilitic arthritis, undoubtedly syphilitic, that are not generally recognized, chiefly because the possibility is never entertained when the diagnosis is made. Some of them closely mimic other commoner conditions. (3) It is very important to diagnose these cases, and to diagnose them early, because tremendous suffering, danger, crippling, etc., are otherwise involved. (4) In every joint case, of whatever kind, the possibility of syphilis should be considered and investigated. (5) *Most important of all, a joint puncture, with Wassermann reaction and cytological examination of the fluid, and a Wassermann reaction of the blood, should be done as a routine in every case of arthritis of every kind.* (6) If the case remains undiagnosed after all possible investigation, the effect of a course of anti-syphilitic treatment should be tried.

R. L. Cecil and B. H. Archer² make a useful and practical contribution on the *classification and treatment of chronic arthritis*. In an affection such as arthritis with a variety of causes, a simple scheme of classification, preferably

clinical, must be the basis for rational treatment. Unfortunately this group of diseases is still commonly regarded as a whole, and no effort is generally made to distinguish the various forms, some of which are highly amenable to treatment, whilst in others palliative treatment is alone possible. These authors adopt the classification of Nichols and Richardson,³ who divide the joint lesions of chronic arthritis into two very definite pathological groups: (1) Those which arise from primary proliferative changes in the joints, chiefly in the synovial membrane and in the perichondrium. This type they term 'proliferative' arthritis. (2) Those which arise primarily as a degeneration of the joint cartilage. This group is referred to as 'degenerative' arthritis. *Proliferative arthritis* can be subdivided clinically into: (a) Chronic infectious arthritis, referable to foci of infection. (b) Specific arthritis, caused by specific bacterial infection. The gonococcal, syphilitic and tuberculous cases come in this group, as well as the so-called surgical joints, staphylococcus arthritis, pneumococcus arthritis, etc. (c) True arthritis deformans, a chronic progressive polyarthritis of unknown origin. *Degenerative arthritis* includes: (a) Arthritis of the menopause. (b) Degenerative monarticular arthritis (*morbus coxæ senilis*). (c) Senile arthritis.

Chronic infectious arthritis (focal infection type) was by far the most common type found in this clinical study. Infected tonsils were the commonest focus, occurring either alone or in combination with other foci in 61 per cent of the cases. The teeth, alone or with other foci, were the seat of infection in 33 per cent. The sinuses, prostate, gall-bladder, colon, and cervix were the source of infection in a few cases. The treatment of this type of arthritis—*focal arthritis*—consists in the removal of all foci of infection, vaccine therapy, and physiotherapy, and has been fully described in previous numbers of the MEDICAL ANNUAL (*see* 1927, p. 162). Arthritis of the menopause came next in order of frequency, and over 25 per cent of the whole series fell into this group. As previously stated (MEDICAL ANNUAL, 1926, p. 401), arthritis of the menopause is a chronic degenerative polyarthritis occurring in obese middle-aged women at or just after the menopause. The most important part of the treatment is reduction of weight through a low calorie value Diet consisting chiefly of green vegetables. Iodides (e.g., syrup of hydriodic acid 4 c.c., i.e., 1 teaspoonful, three times a day after meals) and Thyroid Extract are also of value. Physiotherapy, especially Diathermy, gives much relief. Degenerative arthritis has not been proved to be of an infectious nature. It is more likely to be a degenerative process allied to arteriosclerosis and other forms of degenerative changes. Treatment of this group should be directed towards accelerating metabolism with iodides, physiotherapy, and other measures.

A. G. Young and J. B. Youmans⁴ report on the use of *O*-iodoxybenzoic Acid in the treatment of 43 cases of infectious arthritis. *O*-iodoxybenzoic acid and its precursors, *o*-iodobenzoic acid and *o*-iodosobenzoic acid, were first described by Meyer⁵ and his co-workers. Pure *o*-iodoxybenzoic acid is practically white, but turns pink on exposure to light. The free acid is insoluble in cold water, and only slightly soluble in hot water. The sodium and ammonium salts are freely soluble. It is an oxidizing substance by virtue of the oxygen combined with iodine. Since the acid has been shown to stimulate the body defences and to be definitely germicidal for streptococci and staphylococci in the presence of blood serum, Young and Youmans thought it might be of value in the treatment of chronic arthritis. The drug was prepared for administration as follows: One gramme of the free acid was placed in a beaker containing 50 c.c. of sterile distilled water, to which ammonium hydroxide was carefully added until it was just alkaline to litmus. Sufficient sterile distilled water was then added to make a total volume of 100 c.c. (The solution may be stirred or

warmed gently without danger of decomposition, but it should not be boiled nor allowed to stand for more than five hours after preparation.) It was given at body temperature, intravenously, by the gravity method, over a period of not less than seven minutes. *O*-iodoxybenzoic acid was given in gramme doses (0.75 grm. for children) at approximately bi-weekly intervals, and from 6 to 25 injections in one or more courses, the time between the courses being approximately six weeks. The sodium salt employed in the earlier cases was responsible for frequent thrombosis of the vein used for injection. The subsequent use of the ammonium salt prevented this unpleasant occurrence almost entirely. The cases included five instances of Still's disease. All except two acute cases had had previous treatment, the majority by many therapeutic measures, including physiotherapy, protein shock, removal of foci of infection, and orthopædic procedures. The results were on the whole very promising, and the drug deserves, as these observers claim, further use over a long period before a final evaluation can be placed on its usefulness in the treatment of chronic arthritis.

C. Sundell⁶ reports favourably upon the 'Pyretic' Treatment of rheumatism, introduced many years ago by Percy Wilde, of Bath. The term rheumatism used in this contribution includes the states of fibrositis, synovitis, neuritis, but not rheumatoid arthritis and the degenerative changes of osteo-arthritis. Pyretic treatment aims at converting a chronic rheumatic process into an acute process. The principle is to envelop the patient once or twice daily in a warm moist atmosphere for twenty to thirty minutes at an optimum temperature of 100° to 105°. This is effected by means of a vapour couch, which consists of a wire or fenestrated pallet covered by several layers of blanket, and forming the roof of a chamber into which is discharged steam from a metal vessel heated by a gas-ring. The steam percolates through the layers of blanket and envelops the patient in a warm moist atmosphere. A metal cover is placed over the body, over which are put rugs and towels, which are tucked round the patient's neck, leaving the head exposed. Several case reports are given, and excellent results obtained.

H. Warren Crowe⁷ reports good results in osteo-arthritis of the hip-joint treated with Vaccines consisting chiefly of streptococci obtained from foci of infection. The affection is commonly regarded as progressive and hopelessly incurable, but Crowe obtained favourable results in over 50 per cent of his cases.

Faber⁸ records good results through Protein Therapy in the treatment of chronic polyarthritis. He deplors the lack of perseverance in keeping up treatment, and the peculiar readiness of these patients to resort to new measures recommended by the laity. They seem unable to realize that polyarthritis, like tuberculosis, requires long and systematic treatment. The fact that a fever so often disappears under the protein therapy indicates that it really acts on the cause.

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ASPERGILLOSIS. (See LUNG, ASPERGILLOSIS OF.)

ASTHMA.

W. H. Wynn, M.D., F.R.C.P.

Sensitization.—Few diseases present so many perplexing problems as asthma. Since Meltzer in 1910 suggested that asthma might be a phenomenon of anaphylaxis, many observations have seemed to confirm his view, which has been widely accepted as true for a large group of cases. According to this view, a person who has asthma is sensitized to a definite substance, and an attack

occurs whenever this substance enters the circulation. The parallelism between the two conditions is shown by the following facts : (1) Anaphylaxis is specific ; (2) Animals sensitized to a definite protein can be intoxicated only by that protein ; (3) In an anaphylactic attack the bronchi are constricted ; (4) The constriction is of peripheral and not of central origin ; (5) Atropine and adrenalin relieve the anaphylactic attack ; (6) Eosinophilia occurs in both. Several observers, however, dispute the theory, and some immunologists, such as Coca, contend that because no antibody can be demonstrated in the blood of asthmatic patients, the condition is not analogous to experimental anaphylaxis.

J. A. Kolmer¹ has recently reviewed the situation, and after stating the arguments for and against the anaphylactic theory, says he is satisfied that there is sufficient evidence of the presence of a specific antibody to warrant the definite opinion that asthma and hay fever are true anaphylactic phenomena. M. H. Kahn,² on the other hand, considers that anaphylaxis may be dismissed from consideration : that protein sensitization is indeed a phenomenon of the disease, but is not the basic cause. Sensitization tests indicate intoxication by some substance, usually protein in nature ; but treatment for purposes of desensitization or immunization he regards as futile in the endeavour to obtain an absolute cure. He considers that the final solution in discovering the genesis of bronchial asthma lies in the phenomena of heredity, the condition being rooted in the biological and physicochemical structure of the chromosomes. An hereditary factor is present, not in a certain fraction of the cases, but in 100 per cent. An absolute cure is therefore not to be expected until a method has been found which will alter the chromosomal constitution either in the adult or in the genetic cells. To some extent the difficulty is one of definition ; the term 'anaphylaxis' has been used too loosely, and should be restricted to the classical symptoms seen in experimental animals, and for the condition in the toxic idiopathies such as asthma the term 'sensitization' or 'allergy' would be more suitable. It is probably true that the tendency to become allergic is inherited, but we do not know the part played by heredity in the cases of asthma not associated with protein sensitization.

Among the causes of sensitization, house dust has gained increasing recognition, and routine tests with dust extracts have been recommended, especially in cases in which other skin tests were negative. Thus A. H. Rowe³ found that 42 per cent of a series of 162 patients with asthma reacted to house-dust extracts, and that 20 patients with perennial hay fever also reacted. Patients frequently gave a history of attacks when in an atmosphere filled with house dust, e.g., after beating carpets, sweeping, or dusting ; 66 per cent of the patients gave a history suggesting such sensitization. House dust arises chiefly from materials of animal epidermal origin. Of these, feather pillows, hair mattresses, woollen blankets, and carpets give rise to much dust. The dust may also contain rabbit and goat hair from upholstery, orris root from face powder, pyrethrum, glue, certain wood and matting dusts, as well as many others peculiar to each environment. Reactions to dust may depend upon one substance or on a summation of reactions to several substances. For testing, extracts of dust were made with 0.5 per cent salt solution and sterilized by 0.3 per cent cresol and by Berkefeld filtration. The tests were made by the scratch method. Patients were tested both with their own dusts and stock extracts. Those who reacted to dust in nearly every case reacted also to other proteins, especially pollen, feathers, horse dandruff, rabbit fur, and sheep wool. House dust can often be controlled by a thorough cleaning of rooms, especially bedrooms, but Rowe considers that in patients with marked reactions it is advisable to desensitize with gradually increasing doses of dust extracts.

F. M. Rackemann and D. S. King⁴ found reactions to intradermal injections of house dust in 36 per cent of asthmatics, but consider that the importance of dust in causing asthma is not proved, and that a bacterial infection adequately accounts for most cases.

Van Leeuwen, W. Einthoven, and W. Kremer⁵ have further elucidated the dust problem. They point out that the asthmatic's environment is of primary importance in determining the intensity and frequency of attacks, and that most asthmatics are free from attacks at high altitudes or on sea voyages. Their health varies from place to place. These authors have formulated the hypothesis that the difference between climates is due to certain allergens in the air. These 'climate allergens' are regarded as the principal causes of asthma in all flat countries with a high humidity and moist soil. Two kinds can be distinguished. *Group A* contains allergens which occur in the outside air; for example, the presence of such allergens in Bristol may induce attacks in a man who is free from asthma in London. *Group B* contains allergens which occur in houses. They are absent or almost absent in well-organized hospitals; hence the comparative freedom from attacks in hospital. It has been shown that the outside air in a place bad for asthma contains water-soluble colloidal substances which on injection into sensitive persons induce attacks, and that dust from private houses where asthma is very frequent contains many more allergens than dust from places which are good for asthma. In Switzerland there is a gradual diminution in the allergen content of house dust as the height increases.

A number of allergens have been determined. An epidemic of asthma in an Italian village was traced to a parasite occurring in grain. Other insects were then found—the common mites in grain, hay, and straw—which formed allergens to which 20 per cent of tested asthmatics reacted. Later it was found that common moulds, like *Aspergillus fumigatus*, etc., abundant in moist and damp houses, formed allergens to which more than 50 per cent of asthmatics reacted. Moulds were found growing readily in kapok, which is used for stuffing mattresses, and which, by the way, is often advised for asthmatics who are sensitive to feathers to replace these in pillows. They can be cultivated from house dust, from grain, and from human dandruff, in fact, from the most varied sources, all accessible to asthmatics. It was found that dilutions of 1-1,000,000 or even 1-10,000,000, when injected subcutaneously into sensitive persons, may cause symptoms of rhinitis, headache, rise of temperature, and malaise. Specific anti-allergens could be demonstrated, and sensitiveness could be transferred to the skin of a normal person. If the benefit of high climates is due to the absence of climate allergens it should be possible to obtain the same benefit in a low-lying country by providing air free from allergens.

Van Leeuwen has established a clinic at Leiden in two badly built, damp houses on clay soil. These houses contain small chambers built of eternit, a kind of asbestos upon which bacteria and moulds cannot grow. They contain an iron bed, iron chair, and an iron cupboard. Bedding is sterilized before use and every month. The patient undresses outside the chamber, enters and shuts the door, and stays there all night, or at first even day and night. The chambers are ventilated by a large exhaustor drawing air from the top of an iron tube, fixed alongside an iron tower 70 to 100 feet high. For patients sensitive to outside allergens such a chamber may not be sufficient, so attempts were made still further to get rid of allergens by drying the air, filtration, and an electrical process. So far 500 asthmatics have been treated. Of these, 75 per cent lost their symptoms in two or three days, about 15 per cent were distinctly improved after two or three weeks, and 10 per cent were not

influenced. These results are much the same as those published by Turban and Spengler, at Davos, in an account of the influence of high mountain air on asthmatics. Those patients who improved were, of course, not cured, and attacks would recur when they went home; but the treatment demonstrated to the patients the importance of dust, it helped in making a correct diagnosis of 'climatic asthma', and it gave an opportunity to begin anti-allergic treatment. Allergen-proof chambers have now been installed in a number of private houses with satisfactory results. The *Type A* allergens—those occurring in the open air—appear to be of much less importance than those formed in the house, and therefore the simple type of chamber without elaborate means for purifying the outside air usually suffices.

The Heart in Asthma.—Conflicting opinions have been expressed as to the effect of asthma upon the heart. Most writers maintain that after a time asthma and the consequent emphysema lead to an enlargement of the right ventricle. Examination of the few post-mortem reports on asthma does not show any constant lesion of the heart, but right ventricular hypertrophy is mentioned more than any other. H. L. Alexander, D. Luten, and W. B. Kountz⁶ have made a detailed study of the heart in 50 asthmatics, all of over five years' duration. In three cases there were definite pathological changes, but in two of these there was valvular disease antedating the asthma; the third was a man of 78 with auricular fibrillation. Three patients showed left ventricular preponderance to the electrocardiograph, and only one showed right ventricular preponderance. The impression was gained that, as a rule, the heart remains singularly free from injury after continuous bronchial asthma despite the accompanying emphysema. This is in keeping with the notoriously low death-rate in this disease. Andral, nearly a hundred years ago, quoted a maxim, then old, to the effect that 'asthma is a brevet of long life'. It is suggested that the increased intrathoracic pressure during asthmatic paroxysms may impede the return of the venous blood, and that the work of the heart thereby may actually become diminished.

TREATMENT.—K. K. Chen and C. F. Schmidt,⁷ in 1924, as a result of their experimental work on **Ephedrine**, suggested its clinical use. S. S. Leopold and T. G. Miller,⁸ in 1925, published the first case reports of its use in asthma. In a more recent paper⁹ they record a series of 59 cases. Nineteen were of the allergic type, and of these, 16 were completely relieved of an asthmatic paroxysm by ephedrine, 1 was partially relieved, and 2 obtained no relief. Thirty-seven cases were of the infectious type, 29 having paranasal sinus infection. Of these, only 14 obtained complete relief, 16 had partial relief, and 7 no relief. Three cases had definite mechanical obstruction in the nose, and are classed as of the nasal reflex type; all these obtained complete relief. Of the total number of patients, 59 per cent were thus completely relieved, 25 per cent were partially relieved, and 15 per cent received no benefit. The dose was from 50 to 100 mgrm. G. F. Munns and C. A. Aldrich¹⁰ have used ephedrine sulphate in 22 asthmatic children. The dose was from 12 to 50 mgrm. It was given by the mouth, in some cases every four hours, in others only as indicated by the symptoms. In 12 patients in the paroxysmal stage or with severe persistent cough there was relief usually within thirty to forty-five minutes; 4 were only partially relieved, and 6 received no benefit; 9 patients had a persistent cough as a major symptom, and in 8 this was relieved; 4 children were nauseated, and 2 of these were not benefited. These results agree with our own experience. The drug appears to have an adrenalin-like action, and has the advantage that it can be given by mouth. When given by mouth its action is less rapid than that of adrenalin subcutaneously, but appears to be more prolonged. It can now be obtained in this country in

1-gr. tabloids. One or two can be given immediately a paroxysm begins, and can be repeated if necessary in six hours. When there are regular nightly attacks, a dose given at bedtime may inhibit the usual attack. It appears to be more effective in allergic cases than in those associated with infection.

T. Nelson¹¹ has obtained good results with **Old Tuberculin** as advocated by van Leeuwen. Before treatment, pulmonary tuberculosis is excluded, skin tests are made, and if necessary nasal infections and obstructions treated. A series of dilutions of old tuberculin is made, each one-tenth weaker than the previous one. The initial dose is 0.5 c.c. of the 1-1,000,000 dilution. The dose is then slowly increased by geometrical progression. For four months injections are given twice a week, then once a week for four months, and lastly once a fortnight for the same period. The maximum dose reached is not stated. Van Leeuwen claimed 50 per cent of cures, and Nelson considers his results even better.

M. A. Ramirez and A. V. St. George¹² have treated a series of protracted cases **Bronchoscopically**. Cultures were made from the right and left bronchi, and if a suitable organism was found a **Vaccine** was prepared. It was interesting that in a considerable number the cultures showed only one organism—usually *M. catarrhalis*—whereas the sputum gave mixed cultures. Mucus was aspirated and adherent mucus removed by sponging. Some patients were treated by applying a 10 per cent solution of **Silver Nitrate**, while others received an instillation of **Lipiodol** 5 c.c. in each descending bronchus. Still others received an instillation of a mixture of **Menthol** and **Camphor** in **Cod-liver Oil**. Treatments were repeated once a week from four to ten times. No ill-effects were seen. All of the patients received vaccines or injections of an offending protein. The specific allergic cases with associated bronchitis were materially benefited but not cured; the non-allergic cases were very much benefited. The authors consider bronchoscopy is of decided value in non-allergic cases with bronchitis, not only because of the benefit derived by removal of adherent mucus and local applications, but also because vaccines made from deep bronchial cultures were more effective than those prepared from the sputum. Cases treated with silver nitrate improved the most.

W. T. McBroom¹³ has used **Blood Transfusion** in 5 cases of asthma. One child of 5 and two men of 35 lost their attacks and have remained well. Two older patients were materially improved but still have attacks. This method seems a rational one deserving of further trial.

J. Boch¹⁴ treats asthma with large doses of **Sodium Iodide**. The drug is given well diluted to prevent vomiting, but it can be taken before or after meals. With cases having early morning paroxysms, three doses are given at 1, 6, and 11 p.m., the amount varying from 25 to 60 gr. The maximum amount required to give relief in the cases studied was 250 gr. in twenty-four hours; 60 gr. have been given three-hourly without any ill-effects. Iodism occurred in a few patients, but never to a severe extent. Continued use of the drug resulted in increased tolerance. The author cured himself of severe asthma by taking sodium iodide intravenously in amounts of 30 to 50 gr. once to three times a day when shortness of breath was anticipated, and later continuing the drug by mouth. He advises that sodium iodide should be given to prevent approaching attacks, but finds it effective in larger doses during an attack. Small doses should be given for a long time as a prophylactic. Definite relief was obtained in 84.6 per cent of his cases.

M. M. Bolshakova¹⁵ has treated asthma with **X Rays**. Eighteen patients, aged from 14 to 52 years, with asthma from one to thirty-seven years' duration, all had respiratory lesions. Exposures of the front and back of the chest at intervals of from three to five days were made the first week and

repeated after three weeks. A fifth of an erythema dose was given on each occasion, the total number of exposures not exceeding eleven. The patients were under observation for two years. The attacks of asthma and all morbid phenomena disappeared totally in 4, and in 2 others there was much improvement. In 6 cases the treatment failed, and the remaining cases are too recent to be of value. He considers that the favourable action of X rays is probably due to destruction and reabsorption of inflammatory products in the bronchi.

W. G. Lewi¹⁶ has treated asthma and hay fever with **High-frequency** for a number of years. He produces hyperæmia over the spine from neck to coccyx, and with a lateral width of three to five inches. A course of six or more treatments was given three times a week. He claims improvement in 91 per cent.

A. F. Hurst¹⁷ holds that there is no condition in which **Exercises** are of more value than in asthma. Their object is to restore the lungs and thoracic cavity to their normal size, so each exercise begins and ends with expiration. Detailed descriptions of suitable exercises are given on the lines of those practised at Bad Reichenhall.

F. Coke¹⁸ gives the results of treatment by modern methods in 300 patients based on a questionnaire; 44 declared themselves no better, 31 a little better, 32 better, 17 much better, 34 very much better, and 65 practically free (had occasional attacks or were perfectly well). The average age in the last two groups was 27, and the duration of asthma 13 years; in the three previous groups the average age was 37 and the duration 15 years, and those no better were 40 years of age and had had asthma on the average for 17 years.

REFERENCES.—¹*Otol. Rhinol. and Laryngol.* 1926, Sept., xxxv, 758; ²*Arch. of Internal Med.* 1927, May, 621; ³*Ibid.* April, 498; ⁴*Boston Med. and Surg. Jour.* 1926, Aug. 19, 347; ⁵*Lancet*, 1927, i, 1287; *Brit. Med. Jour.* 1927, ii, 344; ⁶*Jour. Amer. Med. Assoc.* 1927, March 19, 882; ⁷*Jour. Pharmacol. and Exper. Therap.* 1924, Dec., 239; ⁸*Jour. Amer. Med. Assoc.* 1925, Aug., 157; ⁹*Ibid.* 1927, June, 1782; ¹⁰*Ibid.* April, 1232; ¹¹*Practitioner*, 1927, June, 382; ¹²*Med. Jour. and Record*, 1927, March, 327; ¹³*Canad. Med. Assoc. Jour.* 1927, April, 426; ¹⁴*Colorado Med.* 1926, Sept., 320; ¹⁵*Jour. Amer. Med. Assoc.* 1926, Sept. 25, 1081; ¹⁶*N. Y. State Jour.* 1926, June 1, 489; ¹⁷*Guy's Hosp. Rep.* 1927, Jan., 87; ¹⁸*Brit. Med. Jour.* 1927, i, 955.

BERI-BERI.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Further outbreaks in Bengal of *epidemic dropsy*, which many consider to be a form of beri-beri, have been reported in the past year. H. Hingston¹ reports a few cases which he could not attribute to vitamin deficiency, and he noted symptoms of pernicious anæmia and of marked spasticity. I. R. Anderson² records a carefully observed outbreak in the Mission compound at Kulna, which appears to have been introduced by patients admitted with the disease to the Mission hospital. There was strong evidence of person-to-person infection. H. W. Acton and R. N. Chopra³ report further work on their hypothesis that this disease is due to infection of rice with a sporing bacillus in the humid rainy-season months, and they give data indicating that the recent Calcutta outbreak of epidemic dropsy occurred during the rainy season, and that cases are liable to increase two or three weeks after exceptionally heavy rain damaging rice supplies. They also report cultivating intestinal types of streptococci and bacilli from catheter specimens of the urine of patients, and think that this accounts for the fever occasionally present, and that the diarrhoea is also due to changes in the intestinal flora, and also for the occasional infectiousness of the disease. A. E. Coyne⁴ has treated beri-beri successfully on the usual lines of reducing or stopping rice, and giving vitamins in the form of Marmite.

REFERENCES.—¹*Ind. Med. Gaz.* 1926, Aug., 373; ²*Ibid.* 1927, Feb., 71; ³*Ibid.* July, 359; ⁴*Ibid.* Jan., 17.

BILHARZIASIS. (*See* BLADDER, DISEASES OF; SCHISTOSOMIASIS.)**BLADDER, DISEASES OF.***Sir John Thomson-Walker, F.R.C.S.*

Estimation of Intravesical Pressure.—D. K. Rose¹ has devised an instrument, which he has named a 'cystometer', by means of which measurements of the intravesical pressure after distention of the bladder with known amounts of fluid can be made which will indicate the strength and irritability of the bladder wall and give information as to the condition of the motor and sensory innervation of the latter. The writer has found this instrument of value in cystography for cases of vesical diverticulum, in that, knowing the intravesical pressure and the amount of fluid that has been introduced, he is able to determine whether the malformation is early and elastic or of long standing and fixed.

Bladder Musculature.—E. D. McCrea² has given a detailed description of the musculature of the bladder based on personal anatomical dissections. The musculature of the trigone belongs properly to the urethra and has become incorporated in that of the bladder proper, a view which is borne out by embryological findings. The sphincteric fibres found beneath the trigone, striated and unstriated, represent therefore the distorted posterior urethral wall, and the musculature of the bladder proper has no share in the sphincteric mechanism except through the fibres of the posterior longitudinal bundle.

Neuromuscular Dysfunction.—H. F. Helmholtz³ describes 15 cases of 'neuromuscular dysfunction' of the bladder in children, 6 boys and 9 girls, between the ages of 1 week and 14 years. In 10 of the cases a diagnosis was made of 'cord-bladder'; in 4 of atony of the bladder, presumably due to a lesion of the terminal nerves of the bladder; and in 1 case, very marked relaxation of the urethra was found in a girl 7 years of age who had no urinary control at all. Incontinence and frequency were the most common complaints, and in most of the cases the bladder could be emptied only by contraction of the abdominal muscles, and then only partially. All but one had attacks of fever with definite pyuria on admission, and a suprapubic tumour which disappeared on catheterization. X-ray photographs showed the presence of spina bifida occulta in 6 cases and marked deformity of the spine in 3. Cystoscopic examination was of great help in diagnosis. Two cases of a spina bifida occulta with associated urinary symptoms are recorded by F. H. Colby.⁴

Bladder Lesions in New Growths of Brain and Spinal Cord.—Elsberg⁵ discusses the frequency and character of bladder lesions in new growths of the brain and spinal cord. Brain tumour as a cause of disturbance of micturition is much less frequent than new growth of the spinal cord. Excluding patients in stupor or coma, such disturbance occurs in only 25 per cent of the cases, and in not a few of these the urinary difficulty is, in part at least, the result of a clouding of consciousness or a psychic defect. In some, increased frequency is due to increased renal activity, and in such cases of polyuria there may be occasional nocturnal incontinence. Incontinence associated with intracranial new growth is usually an overflow from retention, and the relative frequency of the incontinence ought to be, and would be, much smaller if it were possible to distinguish in the patient's history between false incontinence due to overflow and the loss of control due to psychic disturbance or to an actual weakness or paralysis of the vesical and urethral musculature. Difficulty in micturition and increased frequency occur fairly often in cases of brain tumour; but, if patients in the terminal stages of their diseases be excepted, incontinence of urine is frequent only in frontal lobe growths. If patients in stupor or coma or with marked mental changes are excluded, urinary disturbances are not more frequently associated with subcortical than with cortical growths,

and are as often associated with superficial growths such as endotheliomas and cerebellopontine-angle tumours as with deeply-situated infiltrating growths.

With regard to tumours of the spinal cord, a tumour external to the substance of the cord is more likely to cause bladder disturbance than one within the substance; thus, in the writer's series, 80 per cent of the extramedullary growths, 84 per cent of the extradural growths, and 60 per cent of the intramedullary growths, had bladder disturbances. The lower down in the spinal cord the compression by the tumour, the greater is the frequency of bladder disturbances: thus, Cervical I–VIII, 71 per cent; Thoracic I–VI, 74 per cent; Thoracic VII–XII, 81 per cent; and lumbosacral and cauda equina, 87 per cent. Bladder disturbances usually appear late in cases of cord tumour, except in extradural malignant disease, the progress of which is so rapid. Usually, with extramedullary tumours, six to twelve months elapse before vesical disturbance is noticed, though there may be but little disturbance even after many years if the tumour is slow-growing. The spinal centres to the bladder lie in the sacral segments, and it is surprising that even in the case of tumours in this locality at least a year will elapse before distinct bladder disturbances are observed. In cases with growth within the substance of the cord, interference with bladder function, although more rare, appears earlier—in 50 per cent of cases within twelve months of the commencement of symptoms. With the reservation that a slow-growing or a soft tumour causes less interference with cord-function than a rapidly growing or a firm one, it may be said that, if spinal symptoms have lasted less than six months, difficulty in emptying the bladder is most frequent; if they have lasted from six to twelve months, difficult micturition or incontinence are frequent; and when signs of spinal compression have lasted several years or more, incontinence, due either to overflow or true paralysis of the sphincter muscle, is most frequently observed. In any case, both sensory and motor functions must be considerably involved before marked bladder disturbances occur, and it must never be forgotten that a patient with a brain or spinal-cord tumour may have a bladder disturbance which is in no way connected with the intracranial or spinal disease. Whenever, therefore, bladder disturbances persist after the relief of the intracranial or spinal lesion, the bladder should be examined for evidence of local disease.

In the treatment of atony of the bladder secondary to lesions of the cord such as tabes, M. F. Campbell⁶ recommends, in addition to measures designed to keep the urine acid, to prevent infection, and to prevent the accumulation of residual urine, that attempts should be made to re-educate the bladder mechanism. The bladder is filled and the patient directed to empty it, and during each emptying he is told to practise starting and stopping micturition several times. Although this may be found impossible at the first trials, the writer states that he is surprised at the improvement in control in many cases.

Exstrophy of Bladder.—C. H. Mayo and W. A. Hendricks⁷ describe the technique generally followed in the treatment of exstrophy of the bladder at the Mayo Clinic. A lateral oblique incision 10 cm. in length is made over the right iliac fossa. The ureter is identified by stroking the peritoneum, when a definite peristaltic wave becomes visible. After incising the peritoneum, the ureter is freed and lifted for from 5 to 7.5 cm. and divided between clamps about 2.5 cm. from the wall of the bladder. The distal end of the ureter is ligated, and the peritoneum is sutured behind the freed proximal end. "The anastomosis of the right side is made first because of the mobility of the rectosigmoid and the convenience of bringing it to the right lower abdomen without first having transplanted the left side, which would cause tension and limitation of the segment of bowel to be used". At a point opposite the isolated ureter, an incision about 5 cm. long is made through the serous and muscular coats of the

bowel in the line of a longitudinal band and curving slightly outwards at its upper end. At the lower or distal end of this incision a puncture is made in the mucous coat of the bowel large enough to admit the ureter. The lower end of the ureter is split for 0.6 cm. A curved needle carrying No. 0 catgut is passed through the open end of the ureter and tied to the tip of it. The short end of the catgut is guided into the open end of the ureter for a distance of about 6 cm. to ensure that the ureter will remain patulous during the early days of œdema following its transplantation. The curved needle is passed through the opening in the mucous layer of the bowel, and is made to emerge from within outwards, 1.25 cm. below the distal end of the incision in the bowel and in the line of the longitudinal band, drawing the catgut with the attached ureter into the lumen of the gut. The catgut is then fixed and tied off at the point of its emergence through the bowel wall. Interrupted sutures approximate the divided peritoneum and muscles of the bowel wall over the ureter, every other stitch picking up the outer wall of the underlying ureter so as to fix its position in the longitudinal bed made for it. A continuous Lembert suture gives additional protection, and two or three additional sutures fix the bowel to the parietal peritoneum to prevent kinking of and traction on the ureter. The second transplantation is carried out in from ten to fourteen days time. (*See also* URETERS, DISEASES OF.)

Necrosis and Gangrene.—W. J. Carson⁸ has collected the records of 167 cases of necrosis and gangrene of the urinary bladder from the literature, and reports a further 6 cases. Recovery occurred in 67 of the total of 173 cases. The causes assigned were as follows: retroversion of the gravid uterus in 40 cases, necrosis following on difficult labour in 23, following on various forms of external pressure on the bladder other than the above in females in 11, following on cystitis in 14, stricture of the male urethra in 9, prostatic obstruction with retention in 6, vesical calculi with retention in 6, the effect of irritants in 6, following on general infections in 15, following on lesions of the central nervous system in 12, the result of traumatism in 5, extroversion of the bladder through the urethra in females in 6, miscellaneous causes in 20 cases. Retention of urine was present in 76 of the 173 cases.

Leukoplakia.—R. A. Hennessey⁹ reports a case of leukoplakia of the bladder occurring in a male, age 39 years, in association with a large free vesical calculus. The clinical and post-mortem details are fully set out. The relationships of the deeper layers of the squamous epithelium of the leukoplakial area to the underlying corium suggested, in places, a precancerous development. The literature relating to leukoplakial changes in the urinary organs is briefly reviewed.

Hypertrophy of Interureteric Bar.—F. Hinman and M. B. Wesson¹⁰ state that while hypertrophy of the interureteric bar has long been recognized as one of the pathological changes due to back-pressure resulting from obstruction at the bladder neck, or in the urethra, the fact that this condition can of itself produce obstruction to micturition has never been sufficiently emphasized, and they report four cases in detail in support of this statement. Some cases of hypertrophy of the interureteric bar producing obstruction closely simulate those of 'median-bar obstruction' or so-called contracture of the neck of the bladder; but whereas in the case of the latter condition the 'punch operation' is often a satisfactory proceeding, its use in the treatment of the former condition is unwise in view of the danger of severe hæmorrhage. The writers prefer to open the bladder, incise the ridge, and suture the incised edges to control hæmorrhage, or, if there is marked pouching of the supratrigonal portion of the bladder base, to resect the hypertrophied bar and supratrigonal pouch, subsequently reconstituting the base of the bladder by suture. It is important,

before operating for hypertrophy of the interureteric bar, to search for evidence of any obstructive lesion to which it may have been secondary, and to remove this obstruction first and then to allow a sufficient period of time to elapse in order to decide whether or not there is any persistence of obstruction which can be attributed to the presence of the interureteric bar.

BACILLARY AND OTHER INFECTIONS.

Urine Reaction and Bladder Symptoms.—The importance of the reaction of the urine in the causation of bladder symptoms is not always recognized. In non-infected urines this point is common knowledge and the correct treatment is usually adopted, but when infection is present it is often forgotten that the correction of the excessive acidity or alkalinity of the urine will of itself in most cases relieve the symptoms without the aid of antiseptic drugs. True, the cause of the over-acidity or alkalinity of the urine will remain, and the irritating reaction will be re-established, if the infection is not cured by antiseptics. But the antiseptics may fail to act until the reaction is corrected; or, again, the symptoms may only be increased by the antiseptics if the reaction does not receive attention. An example of this is when the urine is intensely acid in a case of infection with the *Bacillus coli*. Hexamine in such cases will usually increase the symptoms, and the best treatment is to give alkalis and wait until the irritation or strangury has settled down before commencing antiseptic treatment. Again, when an alkaline cystitis is present the hexamine is useless, for it does not give off formaldehyde in an alkaline urine, and acidifying drugs in increasing doses should be administered, while the urinary antiseptic is held over until the urine has become sufficiently acid to dissociate it.

The acidifying drugs that are at present in use are the Benzoates (sodium and ammonium) and Sodium Acid Phosphate. The latter is the more powerful, and should be used in increasing doses until the urine is clearly acid. It is interesting to note that the combination of the benzoates with acid sodium phosphate does not appear to have a more powerful effect than the drugs used separately, and that in certain proportions they form an explosive mixture.

M. Muschat¹¹ found by experiment that 15 gr. of Ammonium Chloride given thrice daily causes a decided increase in the normal acidity of the urine, and may be used in similar doses to change the reaction in cases of alkaline cystitis.

Encrusted Cystitis.—B. H. Hager¹² reviews 50 cases of encrusted cystitis seen at the Mayo Clinic during the past ten years. He regards the disease as a distinct entity due to an organism which is probably derived from the intestinal tract and was formerly classed with the salmonella group but is now called the '*Proteus ammoniae*'. Clinically, the condition under discussion is characterized by chronicity, symptoms of severe cystitis, and the passage of gritty alkaline urine containing mucus, pus, and a variable amount of blood. In spite of the severity of the local disease, the general condition of the patient is usually excellent. On cystoscopy, the bladder is found to be irritable, with diminished capacity and bleeding readily. Single or multiple areas covered with hard incrustations firmly embedded in and adherent to the mucosa are seen. Removal of the crusts exposes bleeding areas of granulation tissue, which may be flat or papillomatous in appearance. Between the crusts a greyish membrane is frequently found on the mucosa, composed of mucus, cell debris, and red cells, and which is readily removed by irrigation. The condition must be diagnosed from bladder growth impregnated with urinary salts, leucoplakia, and true vesical calculus. As regards treatment, the best results were obtained by the removal of the incrustations by curette followed by the application of strong Silver Nitrate solution to the raw areas. [In severe cases when the whole surface of the bladder is encrusted with phosphates the

reviewer has found that suprapubic Cystotomy, with thorough washing of the mucosa with Dilute Acetic Acid, is the most effective method of treatment. This is followed by a course of antiseptics.—J. T.-W.]

Bilharziasis.—Esmenard,¹³ discussing the treatment of bilharziasis, recommends the administration of Antimony Potassium Tartrate on the following lines: (1) Commence with an intravenous injection of 0.03 grm. dissolved in 6 c.c. of water. (2) Increase the subsequent doses as follows: 0.05 grm., 0.075 grm., 0.1 grm., 0.825 grm., etc. (3) Give the drug intravenously every other day only, watching its effects carefully. (4) Stop the injections when an injection of 1 grm. or 1.5 grm. in one dose has been reached. (5) If, at the end of such a course, cure is not complete, do not repeat the injections until an interval of some weeks has elapsed. At the slightest sign of intolerance of the drug, such as general fatigue, vomiting, pruritus, or slight albuminuria, suspend the treatment. Treatment must be continued until the ova, as shown by repeated laboratory examinations of the urine, have been rendered sterile. An organic preparation named Stibenyl has recently been produced as a substitute for the mineral salt, as being more easily tolerated. It is given intravenously in relatively large doses as follows: 0.1, 0.2, 0.3, 0.4, 0.5 grm., on alternate days, keeping subsequently to the last dose as a maximum.

NEW GROWTHS.

Sarcoma of the bladder is a rare growth, and analysis by J. R. Caulk¹⁴ of the cases reported in the literature indicates the great tendency for this type of growth to originate in the trigone and at its junction with the bladder base. The writer, who records a case, ascribes this to some fault in the fusion of the two fetal surfaces at the junction of the trigone and the base of the bladder.

A case of sarcoma treated by Total Cystectomy is reported by H. L. Cecil.¹⁵ X-ray treatment only aggravated the patient's symptoms, and fulguration through a suprapubic cystotomy wound was followed by fungation of the tumour. The right ureter was implanted into the skin of the right iliac fossa, and fourteen days later the left ureter was similarly placed in the left iliac fossa. Three weeks after the second implantation, the whole bladder was removed, leaving the prostate in position. One year and nine months after the operation, the patient had a recurrence at the outer border of the left rectus muscle, which was adherent to the pubic bone, and this was removed completely with the cautery.

E. S. Judd¹⁶ has analysed a series of 708 cases of 'bladder growth' seen at the Mayo Clinic between 1915 and 1925 inclusive. The disease was too advanced or the clinical condition too poor for any treatment in 102, and after the examination of these the average length of life was found to be just short of 9 months, the average duration of the disease having been 32 months. From the point of view of treatment, the writer classifies tumours of the bladder into three groups: (1) Cases of benign tumour, most of which are papillomata and should be treated by Endoscopic Methods. The diagnosis should be made with certainty, for, if there is any question as to the nature of the tumour, operative treatment is preferable. (2) All malignant cases in which the process is still confined to the bladder, and all cases in which the diagnosis is questionable. The treatment indicated is Radical Removal of the growth and reconstruction of the bladder, if this is possible. The writer is of opinion that cases occur in which the entire bladder should be removed if there is a reasonable prospect of eradicating the disease after transplantation of the ureters into the rectum. Drainage of the renal pelvis to protect the anastomosis of the ureter with the bowel will reduce the risk in certain cases. The writer finds that after an extensive partial cystectomy and an attempt to reconstruct

the bladder, a long-continued sinus infection has persisted which ultimately led to a fatal termination, although there was no recurrence of the carcinoma. (3) Those cases in which the malignant growth is too extensive for removal, in that it has extended to the perivesical tissues, fixing the bladder firmly to the prostate and seminal vesicles or to other pelvic organs. For such growths **Surgical Diathermy** offers the best prospect.

C. A. Waters¹⁷ reports the results obtained by the treatment of 120 cases of 'bladder tumour' at the Brady Urological Clinic by means of deep X-ray therapy, and states that his experience to date would appear to warrant the following conclusions: (1) The best treatment for superficial papillary carcinoma, whether localized or extensive, is a combination of **Deep X-ray Therapy** with applications of **Radium** applied directly to the surface of the growth, especially when the tumour has received from 600 to 800 mgrm. hours of radium before the X-ray treatment is started. In this way the majority of such tumours can be destroyed with a minimum amount of injury to the bladder and irritation of the mucous membrane. (2) Cases of infiltrating carcinoma which are still capable of being removed with a good prospect of success should be dealt with by a **Radical Resection**, for this offers the best chance of complete cure. (3) Twenty-five per cent of the infiltrating growths in the author's series occupy positions that render them inoperable or are so extensive that radical removal is impossible. In such cases, when it is possible to apply radium directly to the growth, both **Radium** and deep X-ray treatments should be given a trial, for, in a certain number, favourable results can be obtained by this method alone. In cases not yielding favourable results by this method, or where it is considered that the growth is sufficiently localized to admit of the implantation of radium needles, the bladder should be opened suprapubically and screened radium needles implanted throughout the growth. If the growth is so extensive that a total of more than 2500 mgrm. hours is necessary for its thorough destruction by implantations, this method should not be considered. (4) The great tendency to recurrence following the apparent destruction of these tumours by the above methods imperatively demands careful cystoscopic supervision subsequently. In at least five of the writer's patients, in whom recurrences ultimately resulted in death, complete cure might well have been obtained had they returned regularly for observation and treatment. Recurrences when found have responded well to radium alone, especially the non-infiltrating papillary carcinomas.

L. Simon¹⁸ discusses the prognosis and treatment of *carcinoma* of the bladder. Of 50 patients operated upon at his clinic between 1916 and 1923, 26 have died, and in 12 of these a radical operation was impossible. However, 24 are alive, 12 of whom have survived a radical operation for over five years. The writer has seen patients die of local recurrence seven, ten, and twelve years after operation. In 18 of the patients still living, one operation sufficed, but in 6 of these cases repeated resections or electrocoagulations have been necessary. Every tumour in which there is a suspicion of malignancy should be treated as malignant by radical resection of the whole thickness of the bladder wall, when possible by the extraperitoneal route. The writer is of opinion that complete cystectomy should seldom be performed. A personal case is quoted in which the whole bladder except the trigone and a margin of 1 cm. around the ureteral orifices was removed. In six months the bladder capacity was found to be 200 c.c. and at the end of two years 300 c.c.

C. F. Burnam and W. Neill, Jnr.¹⁹ describe their results, and the technique employed, in the treatment of epithelial tumours of the bladder with radium, and C. A. Waters²⁰ reports four years' experience in the treatment of tumours of the bladder by deep X-ray therapy with and without associated radium applications.

Total Cystectomy for malignant growths of the bladder is advocated by a number of surgeons, and the technique once more described in detail. That the operation is possible and presents no insuperable technical difficulties was proved many years ago. The trouble is with the results. The great majority of these patients die within a month of the operation, and most of the few survivors within the following year. The results given in the following articles are no better than those previously recorded, and until an improved outlook from the operation can be shown it must remain, at the least, a desperate surgical undertaking.

Five cases of total cystectomy for extensive carcinoma of the bladder are described by A. L. Chute.²¹ In 3 cases the ureters were transplanted into the sigmoid colon; in 1 into the rectum; and in 1, owing to the poor general condition of the patient, tubes were inserted into the ureters and drainage of urine established by way of an incision in the perineum made for the purpose of separating the prostate from the rectal wall. All the patients died within a month of operation. The writer is of opinion, however, that total cystectomy, preceded or followed by transplantation of the ureters, will prove, with further experience and improvement in technique, to be the best method of dealing with extensive infiltrating tumours of the bladder, stubborn recurring growths of the papillomatous type, and growths involving the outlet of the bladder.

Complete cystectomy, according to S. P. Fedoroff,²² is not a complicated proceeding, and if done in two stages is not especially dangerous. In the first stage the ureters are transplanted, preferably into the lower curvature of the sigmoid colon. In the second stage, performed two or three months later, the bladder is completely excised. Twelve cases are reported; all were late cases, and in 11 pyelitis was already present. Eight of the patients died, 2 from causes not attributable to the operation. Of the 4 patients living, 2 are in good health, six years and two years respectively after the operation, whereas 2, operated on a year before, have pyelitis.

In a paper on the treatment of tumours of the bladder, H. Wade²³ discusses the justification and indications for total cystectomy in cases of advanced carcinoma of the bladder. Vesical carcinoma long remains intrinsic to the bladder, and metastases occur late. Thus it is possible to presuppose a case involving the base of the bladder in which a total cystectomy will remove the growth entirely before metastasis has occurred. Even if metastasis is already present, the writer is of opinion that this operation is justifiable in occasional instances in which the disease is too advanced for partial cystectomy owing to involvement of both ureters or the internal urinary meatus and prostate, because of the relief afforded in the event of a successful issue to the operation. Suprapubic cystotomy or implantation of ureters as palliative measures in advanced cases do not relieve the recurrent painful spasmodic contractions of the bladder which are responsible for the great suffering that these cases undergo in the latest stages of their disease. For the preliminary transplantation of the ureters, the writer recommends implantation to the lateral aspect of the abdominal wall as being easier, quicker, and safer than into the bowel, owing to the fact that these patients are so debilitated as to have little resistance to septic infection. Some three weeks later the final operation is undertaken. The bladder is filled with a 1-1000 solution of silver nitrate. The peritoneal cavity is opened through a mid-line suprapubic incision carried down to the symphysis pubis and freely exposing the anterior extraperitoneal surface of the bladder. The healed cicatrix of any previous cystotomy operation is left attached to the surface of the unopened bladder. The peritoneum is dissected off the summit and posterior aspect of the bladder, the obliterated

hypogastric arteries and the urachus being divided. The bladder is further mobilized, the superior vesical arteries are ligated, and the vasa deferentia defined and divided. The ureters have already been divided close to the bladder. The partially isolated bladder is now pressed firmly backwards, and the pubo-prostatic ligaments are defined, clamped, and divided. The anterior surface of the prostate is then cleared to its apex; then the lateral and posterior aspect of the gland is freed. In so doing the vesicles are isolated and carried forward along with the bladder and prostate. The prostate is now drawn out of the muscular hammock in which it is slung, and which is formed by the levatores ani muscles on either side and the recto-urethral muscle below. The urethra is then divided, cauterized, and ligated, and the bladder, prostate, and vesicles are removed in one piece. The peritoneal cavity is closed, and a gauze tampon loosely packed into the space from which the bladder was removed, and brought out of the lower end of the abdominal wound.

G. G. Smith²¹ reports a case of carcinoma of the bladder for which he performed total cystectomy. The bladder, together with the prostate, was removed after the ureters had been divided low down. Rubber tubes were passed up each ureter. The lower end of each ureter was tied to the tube within it, and after passing a catheter into the rectum and opening the rectum at the level of the peritoneal reflection, the ureteral tubes were fastened to the rectum and drawn out through the anus, leaving about 1 in. of free ureter projecting into the rectum. Some leakage of urine and feces occurred from the suprapubic wound for about six weeks following the operation; after this, however, the wound healed, and in some three months' time the patient's general condition was good and he could hold water in the rectum for three hours.

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BLOOD TRANSFUSION.

A. Rendle Short, M.D., F.R.C.S.

We shall here only consider methods; indications will be found under the respective diseases.

A neat apparatus for the transfusion of whole blood, not citrated, is described by Jubé. We can personally recommend it. It consists of a syringe delivering 5 c.c. at a stroke; the piston is grooved, and is rotated at each stroke so that blood is aspirated from the donor, through a rubber tube leading from a needle, into the syringe, then the piston is rotated to turn the groove towards the side-outlet that leads to a cannula in the patient's vein. (*Plate IV.*) It is made in Paris.

H. F. Stoll¹ figures a special needle with stopper and eyelet, which is inserted into the donor's vein; multiple syringes are used to transfer the blood.

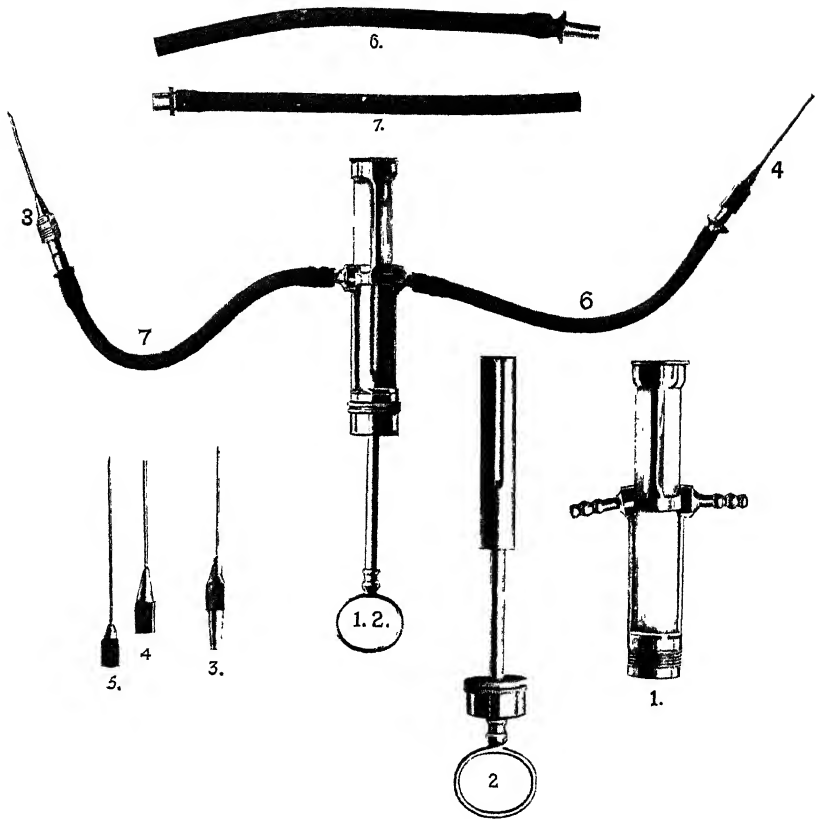
G. C. Freeman and A. J. Whitehouse² report another case of a donor, apparently belonging to the group which would qualify him to be a universal donor, whose blood proved to be dangerous. Direct matching of the donor's blood against the patient's is advised wherever possible.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1926, Nov., 668, ²*Ibid.* 664.

BLOOD-VESSELS, SURGERY OF. (See ANEURYSM; VASCULAR SURGERY.)

PLATE IV

BLOOD TRANSFUSION



Jubbé's syringe for blood transfusion. 1, Barrel; 2, Piston; 3, Needle for donor's vein
4, Cannula, and 5, Trocar, for recipient's vein; 6, 7, Rubber connecting tubes.

BOILS. (*See SKIN, STAPHYLOCOCCAL INFECTIONS OF.*)

BONE REPAIR AND BONE GRAFTING. *E. W. Hey Groves, M.S., F.R.C.S.*

The actual behaviour of bone after injury, and its capacity for repair, remain subjects about which there is still much to learn. R. W. Johnson¹ has contributed a most valuable article dealing with the *blood-supply of the long bones*. His work has consisted of an experimental study to determine which set of blood-vessels are most important in bringing about the repair of bone injuries. He points out that every long bone receives three different sets of blood-vessels, namely, the nutrient artery, the metaphysial vessels, and those of the periosteum. In his experiments a hole was bored in the side of the shaft of the tibia, and then two out of the three groups of blood-vessels were blocked. The animals were killed at varying periods, from one to six weeks after. Sections through the bone at the point which had been drilled demonstrated the amount and character of the repair which had taken place. The general results of these experiments are very interesting in their bearing upon the problems of non-union and of delayed union of fractures. The main conclusions are:

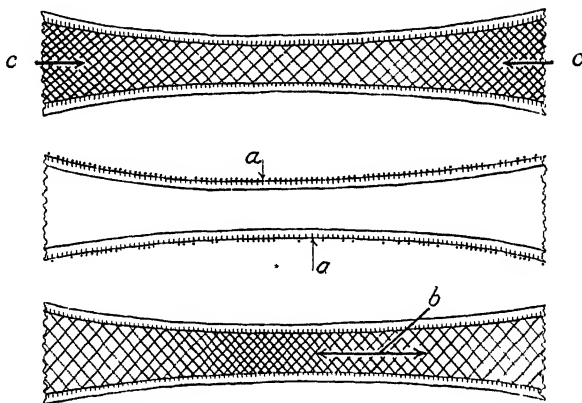


Fig. 11.—Blood-supply of the diaphysis. *a*, Periosteal supply; *b*, Nutrient supply; *c*, Metaphysial supply. (*Re-drawn from the 'Journal of Bone and Joint Surgery'.*)

- (1) The nutrient vessels maintain viability throughout the medulla and supply the deep portions of the cortex. If these vessels are intact, repair is active.
- (2) The metaphysial vessels supply the same parts of the bone as the nutrient artery, but only towards the ends of the bone. A bone which only has its metaphysial blood-supply shows great delay in the repair of injuries in the middle of the shaft. (3) The periosteal blood-vessels only supply the superficial portions of the cortex, and are unable to effect a collateral supply to the medulla for some weeks. Repair which is dependent on periosteal blood-vessels is relatively poor. (4) Regarding the shaft as a whole, the nutrient vessels are the most important, the metaphysials next, and the periosteals the least. (*Fig. 11.*)

G. M. Dorrance and G. W. Wagoner² have drawn attention to certain possible uses of *thin osteoperiosteal grafts*. They comment upon the fact that the value of such grafts, which was proved by Delagènière, has never been appreciated outside France. The comment which might be made on this statement is that this type of graft has often been tried with very disappointing results.

We must also add that the contribution of the authors under consideration is rather meagre and unconvincing as to the part played by the graft. They take the grafts from the subcutaneous surface of the tibia, cutting a ribbon of the necessary length and width and consisting of the whole thickness of the periosteum together with an underlying thin section of bone. Such a graft is very easy to place in any position, as it can be straightened or curved to fit any surface. The special use of this type of graft which the present authors suggest is for bringing about ankylosis of the joints without opening the articular cavities. Thus in such joints as the wrist, ankle, or knee, in which the joint surfaces are subcutaneous, it is comparatively easy to make a tunnel in the bone into which the flexible graft can be inserted.

P. J. Verrall³ has used a simple method for *fixation of the sacro-iliac joint by means of a bone-graft*. He does not expose the diseased portions of the joint or attempt any resection. The principle of the operation is rather like that used in the Albee spine graft. The posterior superior iliac spines are

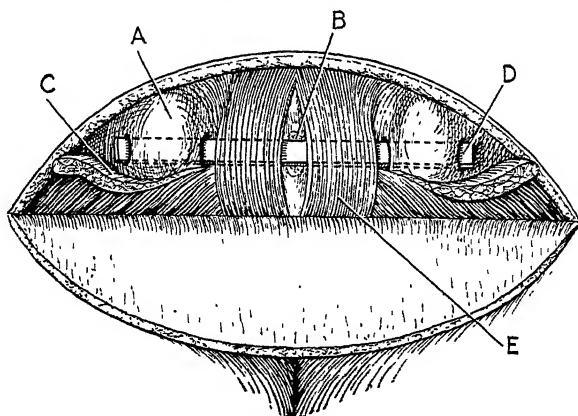


Fig. 12.—Verrall's method of fixation of sacro-iliac joint by means of a bone-graft. A, Posterior superior iliac spine; B, Sacral spine (removed); C, Gluteus maximus; D, Graft; E, Erector spinae mass. (Re-drawn from the 'Journal of Bone and Joint Surgery'.)

exposed on both sides by a curved transverse incision across the back. A tunnel is then made from the outer side of one of these processes across the back of the sacrum to the outer side of the process on the opposite side. Through this tunnel a fresh tibial bone-graft about half an inch wide is driven, and there lies secure without any suturing. (Fig. 12.)

REFERENCES.—¹Jour. Bone and Joint Surg. 1927, Jan., 153; ²Jour. Amer. Med. Assoc. 1926, Oct. 30, 1433; ³Jour. Bone and Joint Surg. 1926, July, 491.

BONES, BRITTLE. (See X-RAY DIAGNOSIS.)

BONES, LONG, SARCOMA OF. (See also X-RAY DIAGNOSIS.)

E. W. Hey Groves, M.S., F.R.C.S.

The diagnosis of the nature of a swelling of one of the long bones has always been, and still remains, one of the most difficult problems in surgery. It is a matter of great interest to find that one of the greatest living authorities on this subject maintains that this difficulty is now greater than ever. J. C. Bloodgood,¹ who has been engaged for so many years in the study of sarcoma of the bones, contributes a most instructive article on the problem of how to

diagnose and treat a bone lesion. He points out that, although we know so much more about the structure and course of bone sarcoma, yet the advances in clinical methods have thrown a much greater responsibility upon the diagnostician. In the first place, patients come for advice at a much earlier period than formerly, and it is in the early stages of the disease that certainty of recognition is most difficult; secondly, the examination of tissue taken from the tumour during life presents great difficulties both of technique and interpretation; thirdly, we have come to recognize the fact that there are certain growths of the bones, notably osteitis fibrosa and the giant-celled myeloma, which are certainly not malignant; whilst last, but not least, among the responsibilities of modern diagnosis is the advent of the X rays and their interpretation. Thus, though we now know much more about new growths of bone, yet it is much more difficult to be certain of diagnosis in early cases of the disease.

Nothing emphasizes more clearly the difficulties of the problem than a careful perusal of Bloodgood's paper, for it is abundantly evident that there are many cases about the nature of which expert opinion is still divided even after the removal of the specimens, and also that mistakes have been made, and will continue to be made, even by those who specialize in this subject. He discusses first the central lesions of the long bones. It is probably in connection with this type of disease that the majority of mistakes have been made. Apart from metastatic growths it is very doubtful whether there is any truly malignant central sarcoma of bone. The two diseases which occur in the central part of the bone most commonly are osteitis fibrosa and giant-celled myeloma. The former of these may exist as a fibrous mass, fibrous tissue filled with cysts, or a large cyst with a connective-tissue lining. It is a disease of young patients, and is recognized by the occurrence of a fracture after a trivial accident. Such a condition will undergo spontaneous recovery if adequate splinting be done. In fact the occurrence of a fracture is often the first step towards natural recovery. If the cyst is large, or if the bone space contains a quantity of fibrous tissue, recovery will be expedited by freely opening it and curetting. The present writer has drawn attention to the fact that functional recovery in such cases may be greatly expedited by the insertion of a beef-bone graft. The other central bone lesion of common occurrence is the myeloma, which is usually situated towards the epiphysis, from which the most rapid growth of the bone takes place. Such a growth, apart from its characteristic situation, has a typical appearance. In the skiagram it is vacuolated and expands the outer wall of the bone as a thin shell. The treatment of this tumour should always be by curettage, followed by the application of pure carbolic acid. Even if this treatment has to be repeated there is no justification for amputation or excision. The only exception to this last statement is when the growth has so far destroyed the bone as to render the limb useless. Such, for example, may happen at the lower end of the femur if the condyles have been so much destroyed as to make weight-bearing impossible.

In addition to these comparatively common bone cysts or giant-celled tumours, there are one or two very rare central tumours of bone of doubtful nature; these are the chondroma and myxoma and tumours consisting of a mixture of cartilage and mucoid tissue. The pure chondroma is an innocent tumour which will not recur after a local removal. A certain type of myxoma is highly malignant, so that it is doubtful whether amputation will save life. From a practical point of view therefore it would seem to be wise to treat these tumours by local resection of the bone followed by bone-grafting. In the consideration of these central lesions of the bone it must, of course, be understood that only those tumours are under consideration which do not perforate

the cortex of the bone. The common malignant sarcoma of bone is nearly always a new growth which occupies both the central and the periosteal tissues. If it can be recognized therefore that a tumour of the bone occupies both the central and the peripheral areas, then it should be unhesitatingly diagnosed and treated as a sarcoma.

The second portion of Bloodgood's paper deals with the periosteal bone lesions, and here, too, we are confronted with difficult problems in the interpretation both of X rays and pathological findings. The early stage of a periosteal sarcoma is very closely simulated by that of chronic osteomyelitis and by myositis ossificans. When confronted with a case which presents this doubt, the possibility of making a diagnosis by means of a biopsy—that is, the examination of a piece of tissue taken from the living patient—presents itself. Unfortunately, however, experience has shown that this procedure is neither easy nor free from danger. Bloodgood considers that in dealing with a suspected sarcoma a biopsy should never be performed unless immediate amputation can be carried out in the case of a positive result. This means that the services of a very expert pathologist must be available to make a frozen section at the time of the operation; but a frozen section can only be made of soft tissue, as bony tissue will require time for decalcification. The author thinks that the soft tissue immediately outside the bone will always show characteristic cells if the growth is a sarcoma. If the obtaining of an immediate frozen section is impossible, the utmost precaution should be taken to avoid dissemination; the piece removed should be taken by means of a cautery knife, and the cut surface treated by carbolic acid and then by alcohol.

In regard to the treatment of sarcomata of the long bones, the author considers that, when the growth occurs in the upper limb or in the lower limb at or below the lower third of the thigh, Amputation is indicated. If the diagnosis in such cases can be made at an early stage, then there is a good prospect of cure. He states that there is accumulating an increasing number of such cases which have survived for more than five years. In all but the earliest cases of disease, and in sarcoma of the lower limb above the upper third, Radium or Deep X-ray Therapy constitute the only methods of treatment.

REFERENCE.—¹*Jour. Bone and Joint Surg.* 1926, July, 470; Oct., 727; 1927, April, 217.

BONES, TUBERCULOSIS OF. (See TUBERCULOSIS OF BONES AND JOINTS.)

BRAIN, ABSCESS OF.

Geoffrey Jefferson, M.S., F.R.C.S.

Treatment of Chronic Brain Abscess.—W. E. Dandy,¹ in a recent paper, advocates a thoroughly conservative line of treatment for chronic cerebral abscesses. Through a small incision a small hole is burred in the bone, and a brain cannula inserted into the abscess cavity and kept *in situ* until pus ceases to drip. No attempt at aspiration is made, and the wound is then securely closed. The process may or may not have to be repeated. Dandy claims good results by this method of handling, to which he has been led by the observation that many times the manipulations necessary to procure free drainage by a tube have had a disastrous effect in disseminating infection. [It is always a difficult matter to coax a drainage tube through the relatively thick wall of a chronic abscess, and indeed most surgeons will recall cases in which the immediate improvement following on the evacuation of pus has been followed by a relapse, the formation of a fungus (which always means septic encephalitis), and the gradual sinking of the patient in spite of further attempts at drainage. Many chronic abscesses have been present for weeks and months, which argues considerable defensive properties in the cerebral

tissues. It is not too much to expect that when the greater part of the pus has been liberated those processes will go on to complete the cure; so that, although one may be tempted at first to think that an isolated act of drainage is an unsatisfactory procedure in the brain, there is much to recommend it. Whether or not subsequent tapplings will be required may be gauged by the condition of the patient. *Acute abscesses* are in a different category, for although even in these there is a definite fibroblastic and glial proliferation, there is no distinct wall, and death comes not because drainage is insufficient but on account of diffuse septic parenchymatous infection. It is the measure of the latter process which determines the result; in chronic brain abscess the infection is well localized, and we have little to fear provided that trauma and infection are minimized.—G. J.]

REFERENCE.—*Jour. Amer. Med. Assoc.* 1926, Oct. 30, 1477.

BRAIN, TUMOURS OF. (See also GASSERIAN GANGLION, TUMOURS OF)

Geoffrey Jefferson, M.S., F.R.C.S.

Sir Percy Sargent¹ published a review of his experiences with intracranial tumours analysing roughly his own experience of 336 operations for cerebral tumour, and very rightly complains of the loss of time before surgical aid is invoked. It is perfectly true that operation is rarely thought of seriously until it becomes obvious that life cannot be much longer continued, and it is self-evident that in these circumstances the surgery of brain tumours is likely to be palliative only and comparable to colostomy for carcinoma of the rectum. Sargent complains of the teaching of the student that headache, vomiting, and optic neuritis are signs of cerebral tumour. They are, of course, signs of cerebral compression, and mean often enough that radical surgery is going to be made impossible by high pressure. [The surgical tendency to-day is certainly towards a direct attempt on the tumour itself, and we have left behind us those times when a decompression was considered to be the average treatment. But it is clear that radical attempts at tumour extirpation cannot safely be undertaken when pressure is high. In a proportion of the cases the symptoms and signs of raised pressure are almost all that there is to go upon; but in more a sharply circumscribed neurological lesion precedes all else, and if instead of thinking of syphilis and encephalitis the clinician would think first of tumour, matters would improve. A time will come when people will think little more of a cerebral exploration than they do now of an exploratory cœliotomy.—G. J.]

Sargent's experience agrees with Cushing's that syphilitic and tuberculous masses are uncommon (*see below*, 'Tuberculoma of the Brain'). He believes with regard to the history of the case that the rapidity of the progress of symptoms is more important than the time those symptoms may have been present. Looking back on the history one may find that headache of an unusual severity has been present at intervals of some three or four years, whilst the localizing symptoms have only developed within the last few months. The presumption is that a tumour has been there for much longer than the localizing signs would lead one to believe. Sargent's regional analysis is interesting, particularly from the point of view of cystic degeneration. Of 42 frontal gliomas 6 were cystic, of 12 occipital 1 was cystic, of 31 post-central gliomas 5 were cystic, and of 25 temporal 3 were cystic; so that of 110 hemispherical gliomas 13·5 per cent were cystic. At the same time, of 25 cerebellar gliomas no less than 10 were cystic (40 per cent). There were 41 cases of endothelioma, of which 31 were completely removed; but although this variety is relatively benign and should on pathological grounds be the most favourable of all intracranial tumours, they are technically the most difficult, and their large size when they come to the surgeon renders operation a formidable undertaking.

Meningiomas of the Olfactory Groove.—Harvey Cushing³ has added another chapter to the story of the endotheliomata, and describes his experiences with those meningiomas of the anterior fossa which arise from the region of the olfactory groove. The symptomatology comprises: (1) Complete anosmia; (2) Primary atrophy of one or both optic nerves; (3) Mental symptoms—slow cerebration, loss of memory of recent events, occasional disorientation and impairment of concentration; (4) Absent deep reflexes; and (5) Erosion of the sphenoidal ridges and perhaps erosion of the anterior clinoid processes of the sella. Cushing describes a case in which he fully removed a huge tumour of this variety at the third sitting. The procedure employed in this case was incision of the capsule and piecemeal removal of a good deal of the tumour, the remains of which were not withdrawn till nine days later. Cushing's later technique consists in electro-coagulation of the exposed tumour by means of a very powerful diathermy apparatus. The operation must of necessity be performed under local anæsthesia, and that takes an immense time to perform. He has had the satisfaction of completing the removal in one stage by this method.

Tuberculoma of the Brain.—There was a time when the physician, surgeon, and pathologist, faced with a living patient presenting signs of high intracranial pressure, would all have agreed that the probabilities were in favour of a tuberculoma or syphiloma as causal agent. The lineal descendants of those men are practising to-day. How often, how far too often, does one hear the diagnosis of local brain tuberculosis made, and how rarely is it found! Its rarity in the United States is brought out vividly in the figures of the Peter Bent Brigham Hospital. Among a series of 1000 cases (verified tumours) only 14 (or 1·4 per cent) were tuberculosis. A more generous estimate is based on the 1890 figures of Allen Starr, who, in a collection from the literature of 300 intracranial tumours occurring in persons under 19 years of age, found 132 (50·8 per cent) tuberculomas. So notable a discrepancy needs some explanation, and three occur to mind. First, Cushing's figures include persons of all ages and do not contain the high proportion of the very young that must have swelled Starr's figures; second, tuberculosis is better cared for now than it was formerly, and perhaps is less common in the U.S.A. than in Europe; third, developments in neuropathology mean more accurate grouping of cerebral tumours. Tooth's figures of 500 cases from the National Hospital, Queen's Square, showed only 2·4 per cent of tuberculomas (14 cases); and W. P. Van Wagenen³ found that of 140 cases of brain tumour in patients under 19 years of age in the Brigham Hospital records there were 5 tuberculomas only. Glioma is the outstanding tumour of youth as of more mature age, occurring 99 times in these 140 cases; so that the dice are heavily loaded against the diagnosis that was most popular years ago, and still flourishes endemically to this day.

Contrary to the general belief, the prognosis of tuberculoma is worse than that of tumour. There is little justification for doing more than a decompression, as the results of extirpation are marred by the subsequent deaths of the subjects from generalized tuberculosis, and there is grave danger of setting up meningitis if the nodule is dislodged.

Another form of cerebral tuberculosis is described by I. Pardee and L. C. Knox⁴ as 'tuberculoma en plaque', and they reproduce excellent photographs of a case encountered by them. A female, after a number of attacks of right-sided epilepsy, developed choked discs and finally died rather suddenly. In place of the more common nodular type a large flat firm plaque, 9 cm. by 8 cm., covered the pre-Rolandic area, raised a little above the surface with no fibrous capsule. This type is uncommon and represents the results of a solitary local tuberculous meningo-encephalitic process.

Secondary Brain Tumours.—It is generally assumed when a patient presents the clinical picture of brain tumour that the growth is primary. In the great majority of cases the assumption is a perfectly correct one, but it is a fact that from about 3 to 5 per cent are secondary to growth elsewhere. Routine examination of the chest and abdomen should always be carried out, and an inclusive history taken. Those organs whose blood drains direct into the systemic system are, of course, the most fertile sources of brain secondaries by arterial embolism, for the detached cell groups from gastro-intestinal growths pass through too many filters for their easy passage further afield. W. Shelden⁵ reviews 26 cases from the Mayo Clinic, dividing them into groups. Naturally a mistake is only likely to be made in those cases in which the cerebral metastasis is the first indication of disease, and in those where the primary growth is not easily discoverable. Other categories are those in which a primary malignant growth is readily found elsewhere or in which a previous operation for carcinoma has taken place.

Hypernephroma and breast cancer not uncommonly give rise to cerebral metastasis. H. L. Parker⁶ described four cases (Mayo Clinic) of lung carcinoma that were found to have deposits of carcinoma about the spinal cord or in the brain. Unfortunately the diagnosis of lung carcinoma is rarely made clinically. Of its three forms, nodular, lobar, and diffusely infiltrating, the latter is the most common and is difficult to distinguish from ancient tuberculosis. Post-mortem records and histological study establish the fact that carcinoma and tuberculosis may be seen in the same field. F. Grant⁷ records a case from Cushing's clinic, and suggests that in chosen cases operation may still quite justifiably be undertaken when life is made miserable by pressure. The average survival of these cases is only three months whether operation is performed or not, so no hope other than welcome palliation can be held out to the sufferer.

J. Globus and H. Salinsky,⁸ in an excellent account of 12 cases from the Mount Sinai Hospital, conclude that the following are suggestive clinical manifestations: (1) Acute, often precipitate, onset of cerebral symptoms commonly of a vague, disjointed, or disseminated character. (2) Symptoms of increased intracranial pressure out of proportion to the objective neurological signs. (3) Choked disc is not common and is of low grade. (4) Meningeal signs, often associated with radicular pain, are not infrequent. (5) Psychoses are apt to be present but were not an outstanding feature of their cases. Some statistics compiled from Shelden, Grant, and the last-named workers are of considerable interest. The primary growth was in the lung in 10 cases, kidney in 10, skin in 11, breast in 18, colon in 5, generative organs in 5, prostate, thyroid, pancreas, 1 each. It is characteristic of melanotic tumours that some 50 per cent metastasize in the central nervous system.

REFERENCES.—¹*Brit. Jour. Surg.* 1926, July, 102; ²*Lancet*, 1927, i, 1329; ³*Arch. of Neurol. and Psychiat.* 1927, xvii, 57; ⁴*Ibid.* 231; ⁵*Jour. Amer. Med. Assoc.* 1926, Aug. 28, 650; ⁶*Arch. of Neurol. and Psychiat.* 1927, Feb., 198; ⁷*Ann. of Surg.* 1926, Nov., 635; ⁸*Arch. of Neurol. and Psychiat.* 1927, April, 481.

BREAST. INFLAMMATION OF. (See MASTITIS, CHRONIC.)

BRONCHIECTASIS.

W. H. Wynn, M.D., F.R.C.P.

The diagnosis of bronchiectasis is not usually difficult, but errors may arise from certain preconceived ideas. L. S. T. Burrell¹ draws attention to the frequency of hæmoptysis. This symptom is sometimes thought to be almost pathognomonic of pulmonary tuberculosis. In the absence of physical signs a definite hæmoptysis is very suggestive of tuberculosis, but when there are definite physical signs at the base of the lung, hæmoptysis is no evidence for or against the disease being tuberculosis. He quotes Acland's 25 cases of

bronchiectasis confirmed by autopsy. Of these, 7 had hæmoptysis of a pint or more, 5 had from 2 to 6 ounces, 8 had blood-stained sputum, and in only 5 was there no hæmoptysis. Another fallacy is that the absence of tubercle bacilli in the sputum is of no importance. In any case where there is sputum, failure to find tubercle bacilli after three careful examinations is strong evidence against active tuberculosis. Tuberculosis, especially with excavation, is very rare at the base of a lung, whereas bronchiectasis is common at the lower and middle parts. Characteristic drumstick clubbing of fingers and toes is not seen in tuberculosis, where if there is clubbing it is not so great, the nails being slightly curved and the ends of the fingers little if at all enlarged. Lipiodol injections are of the greatest value, and in certain cases, e.g., the *forme sèche hémoptioïque* in which there is hæmoptysis at intervals but no sputum between attacks, bronchiectasis can only be diagnosed by lipiodol injections. It should be used in all cases of hæmoptysis of unknown origin.

C. Riviere² classifies bronchiectasis into two main clinical groups: (1) The slighter cases, especially seen in childhood, mostly involving small bronchi or bronchioles and with mild or intermittent symptoms; (2) The more serious cases, mostly found in adults, though frequently originating in childhood, where symptoms are continuous and severe (though often with intermissions at first), and where the condition finally amounts to a suppuration within the dilated and thickened tubes. A third place might be given to cases where bronchiectasis is an accompaniment of abscess formation due to aspiration of a foreign body. The symptoms and severity of bronchiectasis vary with (a) the amount and nature of the bronchial dilatation, (b) the adequacy of drainage, and (c) the severity of infection. Even with considerable dilatation a patient may be kept in comparative health and comfort indefinitely provided no severe infection occurs. A condition of chronic catarrh is present, and sputum is abundant; but when the catarrhal condition is replaced with a severe suppurative process the case becomes much more serious.

TREATMENT.—Before beginning treatment it is necessary to find by X rays or bronchoscopy that the disease is not due to a foreign body by the removal of which the condition will be cured. Both Riviere and Burrell discuss the details of treatment. The former considers that only two medical forms of treatment are of outstanding importance—**Postural Drainage** and the **Creosote Chamber**. With these properly applied the majority of cases can be brought to clinical recovery. Unfortunately it is difficult to prevent relapses owing to neglect of treatment. If the tubes are emptied twice a day by lying in a certain position, the sputum will be reduced in amount and become less offensive. Creosote inhalation has a deodorant effect, but also excites cough and helps to empty the tubes. The **Bronchoscope** is not only useful in diagnosis but may be used to aspirate and wash out the cavities. A 10 per cent solution of **Argyrol** is used, followed by painting with absolute alcohol. W. F. Moore, of Philadelphia, is quoted by Riviere as having treated 38 cases by weekly aspiration and lavage without general anaesthesia, and not one patient refused to carry through the course. Should these methods fail to bring relief, there remains artificial pneumothorax or a major surgical operation. A **Pneumothorax** is only possible if the disease is wholly or mainly unilateral. Adhesions may prevent even a partial collapse. Burrell in 19 cases failed altogether in 5, and only obtained a good collapse in 2. Of these two, one is well, and the other free from symptoms as long as treatment is kept up, but the sputum returns as soon as the lung begins to re-expand. In 10 cases sufficient collapse was obtained to improve the symptoms at first, but by a gradual spread of adhesions the pneumothorax space was gradually obliterated. Pneumothorax treatment is only palliative; but in suitable cases it should be tried, as it is

not only safe, but, even if only partially successful, it puts the patient in a better position to stand any subsequent surgical treatment. **Phrenic Avulsion** has been used in the treatment of basal bronchiectasis. Burrell considers the most suitable cases to be those in which artificial pneumothorax is partially successful but diaphragmatic adhesions prevent full collapse. Riviere has not been impressed with the results in his cases. **Thoracoplasty** has proved much less successful in bronchiectasis than in tuberculosis. The thickening and stiffness of the bronchial walls, and often of the surrounding lung, prevents closure of the cavities. Burrell has seen one very successful case with a small basal lesion in which removal of portions of four ribs over the diseased area cured the symptoms. A thoracoplasty adequate for a severe lesion is a formidable operation, and a reduction of sputum, which can generally be achieved by other methods, is, as Riviere remarks, hardly a sufficient reward for the operation. Ligation of a branch of the pulmonary artery leads to fibrosis and shrinkage of the corresponding part of the lung, but in bronchiectasis the results are not favourable, as the cavities are not obliterated. **Lobectomy** is a very serious operation, with a mortality of 52 per cent among the 48 reported cases. Most of the deaths were due to infection of the raw surfaces exposed during the separation of adhesions. Graham destroys the bronchiectatic area piecemeal in several stages by the actual cautery. Among 31 cases operated on by him, 55 per cent were reported well (36 per cent still with an open fistula), 13 per cent markedly improved, 22 per cent dead. The majority of his cases, however, were lung abscesses, and only a few simple chronic bronchiectasis.

Riviere sums up the position with regard to the treatment of bronchiectasis as follows: (1) It is best, as a rule, to be satisfied with a moderate result—that is, with relief of dangerous symptoms, such as can be accomplished in most cases by well-applied postural drainage and creosote chamber, assisted by drugs, and reinforced, if necessary, by bronchoscopic treatment. This applies especially to bilateral cases. (2) Should these measures fail, something further may have to be tried, and its success will depend on the suitability of the method to the type of case. Thus (a) Pneumotomy is suitable for single large suppurating cavities and for very little else; (b) Phrenic avulsion may partly eliminate and assist drainage, in a strictly basal lesion, and is indicated for such; (c) Pneumothorax and thoracoplasty should be reserved for unilateral cases in which the lung and cavities seem likely to be collapsible; (d) Lobectomy and cautery lobectomy can only be considered for well-localized areas of disease. The latter method seems materially to enlarge the scope of the older pneumotomy and to offer external drainage at least to a much larger number of cases.

Bruce Whyte³ advocates endobronchial injections of **Iodized Oil** in bronchiectasis. He adopts the supraglottic method, using 5 to 20 c.c. at intervals of from five to fourteen days. The duration of treatment varied according to the severity of symptoms, up to 16 injections being given. Considerable reduction of sputum and improvement in general health is reported.

REFERENCES.—¹*Practitioner*, 1926, Sept., 183; ²*Lancet*, 1926, ii, 1102; ³*Canad. Med. Assoc. Jour.* 1926, Dec., 1443.

BRONCHIECTASIS IN CHILDHOOD.

Reginald Miller, M.D., F.R.C.P.

L. Findlay¹ has re-examined this subject, using in diagnosis intratracheal injections of lipiodol. He is favourably impressed by the value of this method of confirming a clinical diagnosis of the disease. He recommends the use of a general anæsthetic in children and the introduction of the lipiodol through the cricothyroid membrane. He emphasizes his opinion that this route is the best for use in children, and with it he has obtained excellent results and

encountered no insuperable difficulties. The bronchiectatic cavities in the lungs should be emptied by inversion of the child before the anæsthetic is administered. Of great interest are two questions in prognosis: (1) Can bronchiectasis clear up? and (2) Where it persists, how long does the patient live? Findlay is careful not to express too dogmatic an opinion on either of these questions. On the first point he seems to think that once a true bronchiectasis associated with pulmonary fibrosis and pleural adhesions is established, it is a permanent condition; but he points out that some cases of delayed resolution in pneumonia may clinically resemble early cases of bronchiectasis, and these may certainly recover. He has had the good fortune to examine with the lipiodol method just such a case, and was able to demonstrate that no bronchiectasis was in fact present. This is an important observation. Most physicians would agree with the opinion expressed above, yet many cases of bronchiectasis start from an attack of pneumonia, and it is not clear why one case of delayed resolution will recover and another go on to a permanent bronchiectasis, and, as Findlay says, "the truth regarding the course of this disease is reserved for the future."

Once permanently established there seems little doubt that bronchiectasis shortens life. Findlay quotes those whose clientele lies chiefly amongst adults as stating that they see less of the disease than those who practise amongst children. Older authors were inclined to give 11 years as the average length of life after the establishment of bronchiectasis; but clearly the length of this period must depend on many variable factors, such as the extent of lung involved, the environment of the patient, and so on. Death usually occurs from bronchitis or bronchopneumonia with right-heart failure, or from hæmoptysis, tuberculosis, or cerebral abscess. To this list must nowadays be added the operation of pneumectomy.

REFERENCE.—*Arch. Dis. in Childhood*, 1927, ii, 71.

BUBO, CLIMATIC.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

A good description of this disease, together with a new and promising treatment, is recorded by H. M. Hanschell¹ as the result of experience both in the tropics and among seamen at the London docks. The disease is of venereal origin nearly, but apparently not quite, exclusively, and is seen mainly in seamen. Occasionally an herpes-like eruption may be seen on the penis, which rapidly heals after one application of 90 per cent methylated spirit; but the characteristic lesion is an indolent enlargement of the inguinal glands, usually accompanied by some fever, without any reddening of the skin. The disease is mainly one of the tropics, but cases believed to have been contracted in Marseilles and in England are mentioned. The writer has never seen it in the circumcised, and juice or softened material aspirated from the enlarged glands never showed any micro-organisms even on culture. The disease has previously been described as *pestis minor*. If operations are performed, secondary infection takes place, and many weeks may elapse before healing occurs, while as both the superficial and deep glands are involved their extensive removal has been known to be followed by the subsequent development of elephantiasis. In a case of gonorrhœa with both arthritis and adenitis, the writer found that the Injection of Killed Typhoid Bacilli for a joint complication was followed by rapid disappearance of the adenitis; this observation led him to treat his next case of tropical bubo in the same manner, with remarkable success, and since that experience in 1919 he has continued to use the same measure with uniformly satisfactory results, sterile aspirations being also made whenever any softening of the glands becomes evident. In cases that have already been opened, undermined skin should be cut away under a local anæsthetic, and wet eusol dressing applied, but no other surgical measures are necessary. The

PLATE V

TREATMENT OF BURNS WITH TANNIC ACID



a. The burned area coagulated by tannic acid. The crust is intimately adherent and furnishes an excellent protective covering. *b.* The crust after exposure to dry heat it is beginning to separate at the edges where new epithelium has grown beneath it. *c.* The appearance after thirteen days: the crust has been removed and the surface is covered with epithelium.

Reduced from 'Annals of Surgery'

doses of typhoid vaccine are given intravenously, commencing with 100 million, and it may be repeated in four or five days' time when the fever has subsided, only one to three doses being required. G. C. Low and W. E. Cooke² report the success of Hanschell's method in three cases.

REFERENCES.—¹*Lancet*, 1926, ii, 276; ²*Jour. of State Med.* 1926, Aug., 450.

BURNS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

There are so many different varieties of treatment of burns that it simplifies matters to find one method receiving more or less universal approval, viz., the application of **Tannic Acid**. E. C. Davidson¹ was one of the first to advocate this application. The old teaching as regards prognosis, indicating that a burn of even moderate degree may cause a fatal issue if more than one-third of the total body surface is involved, still holds good. A superficial burn is often most serious. It seems likely that tannic acid is efficacious in precipitating toxic materials formed in the injured tissues, and thus their absorption is prevented. Davidson originally recommended that as soon as the patient is seen he be given a relatively large dose of morphia. The burnt area is then covered with dry sterilized gauze pads held in place by sterilized gauze bandages. The dressing is soaked with a 2.5 per cent aqueous solution of tannic acid. The solution must be made up freshly, because it deteriorates, with the formation of gallic acid, in a short time. Small sections of the dressing are opened for inspection at the end of twelve, eighteen, and twenty-four hours. As soon as the part is found to have assumed a light-brown colour, all dressings are removed. To facilitate removal, the gauze is again wetted with fresh tannic acid, and the wound is thereafter left exposed to the air, protected by a cradle draped with sterile linen. Five per cent tannic acid ointment was used in some cases when the burns were about the eyes, etc., but is not nearly as efficacious as the solution. The tannic acid dressing should be accompanied by the introduction of large quantities of fluid either by the mouth or rectum, or by intravenous infusions.

C. S. Beck and J. H. Powers² also recommend tannic acid applied in the manner described. A case so treated is illustrated in *Plate V*. Coagulation of the burned tissue should be produced as rapidly as possible. This is attained by spraying the burn frequently by means of an atomizer containing the solution. The burn is covered with a fine spray every half-hour until the surface becomes brown or black. Blebs are opened as soon as they form, and the epidermis is removed wherever it separates. Exposure to air seems to facilitate the process of tanning, and exposure to heat hastens drying of the coagulum. A smooth indurated surface is produced which is entirely insensitive. The spray is an improvement in the method of applying the solution, and burns about the eyes, lips, nose, and ears may be treated in this way. The crust formed by the tannic acid treatment in superficial burns should not be disturbed. It separates after about two weeks, leaving a surface covered by epithelium. In deep burns the crust may be removed after two weeks, and skin-grafts applied. Pus may collect beneath the crust, and this will necessitate early removal. This can be done by softening it with vaseline and cutting it free where it is attached to the subcutaneous tissue. Not only is toxæmia prevented, but there is a striking decrease of pain following the application of tannic acid. The crust should be kept dry all through; if wet compresses are applied, toxæmia will occur.

F. W. Bancroft and C. S. Rogers³ conclude that: (1) The use of tannic acid is a distinct advance in the treatment of cutaneous burns. (2) The systematic treatment of fluid depletion is of great value. (3) Patients with third-degree burns often have late elevation of temperature and exhibit signs of infection.

Life may be prolonged in these cases by removing the tanned membrane and treating infection. (4) Skin-grafts should be applied soon after sloughs separate. (5) In children with circular burns of the extremities, caution should be exercised in attempting to correct deformities. (6) In deep burns of small surface area, immediate débridement, associated with skin-grafting, may be of value.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1925, Aug., 202; ²*Ann. of Surg.* 1926, July, 1-19; ³*Ibid.*

BURNS IN CHILDREN.

John Fraser, Ch.M., F.R.C.S.Ed.

The treatment of burns in children was the subject of a British Medical Association lecture by John Fraser.¹ Stress is laid upon the significance of the general pathology. It is natural that the distress of the local condition should so often dominate the picture; but of greater significance, because of its gravity, is the widespread general disturbance, the result of absorption into the body circulation of the products of tissue destruction. The sequence of events in the typical clinical picture is detailed, and the relation of these various events to the pathological changes is demonstrated. Perhaps the most interesting part of the paper is that concerning treatment. The therapeutics of the general condition is fully considered, and the importance of Alkali administration is elaborated. The recent work on the suggested value of urotropine is alluded to, and the importance of exsanguination with blood transfusion in desperate cases is described.

The problem of the local treatment is presented in a somewhat unusual way. "It is possible and convenient to group the various types of local treatment under three headings according to the ways in which they exert their individual benefits. Thus there are: (1) *Fixation methods*, such as the alcohol method, the tannic acid method, and others, all of which are beneficial in so far as they fix the 'cooked' tissues and so arrest the production and absorption of the toxin. (2) *Biochemical methods*—for example, the alkaline treatment—which act by counteracting the toxic substance as it is produced. (3) *Protective methods*—for example, the use of paraffin or ambrine—which exert their benefits by a mechanical protective influence upon the affected tissues." Of these methods, choice is given to the 'fixation' group, and more particularly to the **Tannic Acid** technique. The detail of this is described: The 2.5 per cent watery solution is sprayed upon the surface every hour until tanning is complete; the part is thereafter left exposed to the air, but protected from gross injury by a sterile gauze covering. In the early part of the paper allusion is made to the heavy mortality which hitherto has been associated with burns in children. Since the more general adoption of the tannic acid method of treatment there has been observed an impressive reduction in the mortality.

REFERENCE.—¹*Brit. Med. Jour.* 1927, June 18.

CARBUNCLE. (See FACE, INFECTIONS OF; SKIN, STAPHYLOCOCCAL INFECTIONS OF.)

CATARACT. (See also EYE AFFECTIONS, GENERAL.)

Lt.-Col. A. E. J. Lister, I.M.S. (retd.).

The Pretended Cure of Cataract Without Operation.—Alberotti,¹ at the Ophthalmological Congress at Rome, reported on the method of Lavagna, who uses a secret collyrium and electricity, and claims to cure cataract. After much discussion a resolution was put to the Congress and passed, which stated that, in the present state of scientific knowledge, the cure of cataract by medical means alone was not possible. At the beginning of the affection, when the

fibres are only swollen, some improvement of the vision may be effected by altering the fluid imbibed. When the fibres are markedly altered, surgical intervention alone is useful. [It is well that the opinion of such a body should be widely known. Extravagant claims are being made in certain quarters abroad for electrical treatment. Large sums are demanded and obtained from the credulous for this treatment (see MEDICAL ANNUAL, 1926, p. 78, for further information on the medical treatment of cataract). Briefly, in the opinion of very many, it is doubtful whether medical treatment really is of any use, though there is some evidence in favour of it. It must be remembered always, that to tell a nervous person he has cataract may have a very serious effect on his mental condition and therefore affect adversely his general nutrition, which, in the end, may more than counterbalance any good which local treatment may be able to effect.—A. E. J. L.]

A New Technique for the Expression of the Cataractous Lens in its Capsule.—Lieut.-Colonel H. Smith² believes he has found a method of extracting the lens in its capsule which is superior to his well-known methods which have been used with success by the reviewer and many others, in suitable cases. His new method consists in making every lens 'tumble', as he terms it. The original article, which is well illustrated by many diagrams, must be consulted by those not familiar with his methods. Briefly, his new mode of manipulation makes every lens turn on its horizontal axis and emerge with the lower edge foremost. Smith describes the technique as follows: If pressure is made upon the sclerotic over the vitreous, the latter, being a fluid body, transmits it to the back of the lens and drives it straight forwards. The resistance to its movement is least opposite the middle of the incision; hence its upper edge will tend to present first. To counteract this tendency we apply a smooth curved spatula, of adequate size, its convexity backward, over the middle of the incision. With it we make sufficient pressure to fix the upper edge of the lens and prevent it coming forward. The lens hook is laid on the flat over the sclerotic below, with the heel downward and the point well behind the circumference of the lens, i.e., 4 to 5 mm. behind the sclero-cornea. With it we put up the hydrostatic pressure of the vitreous by pressing it on the flat toward the centre of the globe.

The upper edge of the lens being prevented from coming forward by the spatula, the lower edge has no option but to do so. When it is seen to dislocate, the point of the hook is brought up on to the cornea and insinuated behind the advancing lower margin of the lens. Delivery is completed by folding the cornea behind the lens, while pressure with the spoon is taken off lest the capsule burst. Finally, the upper edge, to which the suspensory ligament is still attached, is raked off the wound. The vitreous is under complete control. Escape will only occur if the surgeon keeps his lens hook back on the sclerotic too long after the lower border of the lens has rolled up; and if it presents, he can still prevent damage, by making good his omission to slide up the point of the lens hook on to the cornea at the critical moment. [The reviewer has talked to an experienced operator, who has tried this method himself in India and thinks very highly of it. This abstract will interest workers in the East specially.—A. E. J. L.]

The Late Results of Intracapsular Extraction of Cataract.—Of special interest to workers in the East are the conclusions of Arnold Knapp,³ who has followed up and re-examined 85 cases of cataract in which the lens was extracted in the capsule by his method. He says that, if the primary result is good, excellent vision is retained in these cases. Patients were seen up to fifteen years after the operation. There is no evidence of degeneration of the vitreous. The freedom from vitreous disturbance in these cases shows the correctness of the

belief that occasional but definite reaction and damage to the eye occur from retained capsule and cortex, or from one or more needling operations. There is a remarkable freedom from glaucoma, from retinal detachment, and from the sequelæ of iridocyclitis, except for the serious but fortunately rare complication of sclerosis of the cornea. [Many thousands of cataracts are extracted in the capsule in India. It will interest many operators, as it did the reviewer, to see what has been their own experience confirmed by a skilled observer under the best possible conditions for investigation. Such conditions are unfortunately often lacking in the East.—A. E. J. L.]

REFERENCES.—¹*Clinique Ophthalmol.* 1926, Oct., 590; ²*Arch. of Ophthalmol.* 1926, 213; ³*Ibid.* 257.

CAVERNOUS SINUS THROMBOSIS. (See also FACE, INFECTIONS OF.)

Geoffrey Jefferson, M.S., F.R.C.S.

Thrombosis of the cavernous sinus is one of the most dread complications of septic processes about the face. Compared with thrombosis of the lateral sinus it is a relatively uncommon happening, but the lateral sinus is in a peculiarly vulnerable position, lying as it does in close proximity to the mastoid cells. The cavernous sinus is rarely infected from the bone in its immediate neighbourhood, the sphenoid, but has disease carried to it by a process of progressive septic thrombosis along one of the several channels that lead into it. O. J. Dixon¹ reports eight cases illustrating the various modes of infection. His first case was a young man of 28 who had an infected hair follicle on his upper lip. He pulled out the hair, squeezed the pustule, and thought nothing more about it. Three days later he was admitted to hospital with cellulitis of the upper lip; within ten days proptosis developed, and in forty-eight hours he was dead. Necropsy revealed septic thrombophlebitis of the right ophthalmic vein and bilateral septic thrombosis of the cavernous sinus; purulent meningitis, leptomeningitis. The organism was a staphylococcus. Dixon's next two examples followed tonsillar infections, the fourth originated in mastoiditis, and the fifth, sixth, and seventh arose from dental infections. Two examples will suffice to illustrate the common features.

In one, a man 39 years of age consulted his doctor on account of pain in his left ear; for this carbolic-glycerin drops were advised, and he worked the next day. Twenty-four hours later the pain returned and the membrana tympani was incised with relief, but next day he was unconscious and died in a few hours. At necropsy there was septic thrombosis of the left lateral sinus, of the inferior and superior petrosal sinuses, and of both cavernous sinuses. In the other, a man of 40 years, ill with a severe cold, had the first and second lower left molars removed and the sockets curetted. Twenty-four hours later he became very ill, temperature 105°, leucocyte count 16,000. Five days after the tooth extraction the left eye began to bulge, but soon receded, so that Dixon withdrew his diagnosis of cavernous sinus thrombosis. However, a week later the patient developed all the signs of meningitis and died. At necropsy a complete suppurative liquefaction of the left cavernous sinus was found, the right being *intact*. It is noteworthy that one of Dixon's cases was that of a boy 5 years old where the infection commenced in a deciduous molar, an unusual if not unique event.

Most cases present certain definite features in common. Of these the most outstanding are two: the triviality of the original septic focus (a minute furuncle, for example, or a dental abscess of quite ordinary type), and the rapidity of the onset of the deep thrombosis. If this serious complication does not arise quickly it is not likely to come at all, and this may comfort us as the days pass and we watch the progress of apparently dangerous infections

—comfort us because we know full well that once cavernous sinus thrombosis is established there is little that can be done to combat it save in a general way. We have yet to be convinced that any major attack on the sinus itself can usefully contribute to a cure, or that, in the two or three cases in the literature in which success has followed on radical surgery, much was obviously contributed to the happy issue by the operator. Several cases of spontaneous cure have been noted.

REFERENCE.—*Med. Jour. and Record*, 1926, Oct., 1088.

CEREBROSPINAL FEVER.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—J. B. Neal and H. W. Jackson,¹ who record their observations on 54 cases of epidemic meningitis in the *first three months of life*, 25 of which were due to the meningococcus, state that the symptoms of meningitis in infancy are quite different from those in older children and in adults. The onset is fairly acute, but rarely so sudden as in later life. The disease is practically always ushered in with gastro-intestinal disturbance. There is nearly always irregular fever. The child is usually irritable and hyperæsthetic. Convulsions may occur early, but are not so severe as those which come on later. Typical symptoms of meningitis, such as nuchal rigidity and Kernig's sign, are usually absent until the disease is far advanced. The reflexes at first are usually normal. A bulging fontanelle is practically always present. A hæmorrhagic rash is very unusual.

E. Schinz² records a remarkable case of cerebrospinal fever in a servant girl, age 23, complicated by protracted fever. After an irregular fever of six weeks' duration an intermittent type set in and lasted nearly two months, the patient becoming wasted to a skeleton. Complete recovery, however, took place apart from *paralysis of the left peroneal nerve* causing equinovarus and steppage gait, and *retrobulbar neuritis*, which developed three and a half and six months respectively after the onset.

S. Battley³ reports a fatal case of *meningococcus purpura fulminans* in a male infant, 10 months old, in whom the total duration of the illness was only twenty hours. Bluish-red blotches appeared on the skin, especially the face and buttocks. Death was preceded by convulsions. The necropsy showed several small hæmorrhages in the pleura and on the epicardium, and extensive hæmorrhages into the suprarenals. Nothing abnormal was seen in the brain except engorgement of the small vessels. Intra- and extracellular meningococci were found in sections of the various tissues. In addition to the occurrence of meningococcus septicæmia without meningitis, the case illustrates the frequency in rapidly fatal cases of suprarenal hæmorrhage, which is the probable cause of death.

L. Weitzel and L. Martin⁴ report a case of *relapse of cerebrospinal fever after cranial trauma*, which is apparently the first example of the kind on record. The patient was an airman, who on the day following a precipitate landing, in which he sustained contused wounds of the face, developed symptoms of meningitis. Turbid cerebrospinal fluid was removed by lumbar puncture, showing a predominance of polymorphonuclear cells and numerous meningococci. Death took place within twenty-four hours. There was no necropsy, but an operation performed after the accident enabled the writers to exclude fracture of the base. Inquiry into the past history elicited the fact that the patient had had an attack of cerebrospinal fever accompanied by purpura eleven months previously. The writers regard the case as an example of a relapse due to persistence of the meningococcus rather than as an attack of cerebrospinal fever.

TREATMENT.—Courtois-Suffit and G. Garnier⁵ record two cases of cerebrospinal fever, one of which was accompanied by meningococcus septicæmia, in

both of which serum treatment proved quite ineffective and was replaced by the use of an **Auto-vaccine**. In the first case rapid improvement took place and the temperature fell to normal, while the second case, in which meningococcus septicæmia was present, ended fatally. P. Luton⁶ has found that subcutaneous, intramuscular, or intraspinal injection of **Meningococcal Endoprotein** is most successful in the treatment of meningococcal infection when serum and vaccine therapy have failed. A cure of meningococcal septicæmia of the pseudo-malarial type is obtained in a few days after two or three intramuscular injections. If there is a meningeal reaction also present, intraspinal injection of endoprotein must be given as well. The successful results, which Luton was at first inclined to attribute to a specific action, appear to be due rather to the effect of protein shock.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1927, lxxxviii, April 23, 1299; ²*Schweiz. med. Woch.* 1927, 621; ³*Amer. Jour. Dis. Child.* 1927, xxxiii, Feb., 244; ⁴*Presse méd.* 1926, 1211; ⁵*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1926, July 2, 1185; ⁶*Thèse de Paris*, 1926, No. 294.

CERVICAL RIB. (See RIB, CERVICAL.)

CHANCROID.

Col. L. W. Harrison, D.S.O.

The great majority of the lesions to which the term 'soft chancre' is applied yield readily enough to such simple measures as dressing with **Hypertonic Saline**, **Chloramine-T**, or **Precipitated Sulphur**. Some, however, particularly the kind with thin undermined edges and attended by considerable pain, can tax the resources of the most experienced. It is for these that the multitude of methods of treatment have been devised.

Flynn¹ characterizes as the best he has ever tried a method which he saw in routine use in an American hospital at St. Thomas (Virgin Islands) as follows: In a glass-stoppered bottle mix **Calomel** 15 grm. with lime-water 120 c.c., and shake several times a day for two or three days. Then add **Tinct. Camph. Co.**, 30 c.c., and **Zinc Sulph.**, 30 grm.; shake the mixture well before use. Apply a local anæsthetic for a few minutes, and then clean the area with soap and water. After this take a thin layer of cotton-wool, lay it on the palm of the hand, and invert the bottle containing the above mixture on it; dress with the wool thus saturated. Renew the dressing daily till the lesions are clean and granulating, and then apply an ointment made of **Zinc Oxide**, **Starch**, **Boric Acid**, and **Camphor**, of each 2.5 parts, with 3 per cent **Carbolated Vaseline** 30 parts.

A. E. Jones² confirms the good results obtained by others from the intravenous injection of **Tartar Emetic** every four days. The initial dose was 3 c.c. of a 1 per cent solution, and was increased by 1 c.c. of the same strength at each subsequent injection. The smallest number of injections necessary to effect a cure was two, and the largest was eight. The general reaction following the injection was slight and had disappeared by the following day.

In *bubo* complicating chancroid, Miskjian³ recommends the following: The contents of the abscess are evacuated through an incision not more than 5 or 6 mm. long and a dressing applied. On the following day, when the inflammation has subsided considerably, **Mencière's Solution** is injected into the cavity. It consists of iodoform 10, guaiacol 10, eucalyptol 10, alcohol (95 per cent) 10, balsam of Peru 30, and ether 100. The solution is allowed to act for a minute and the surplus gently expressed. Two days later the part is examined and, if the *bubo* has not healed, the injection is repeated. In the discussion which followed the reading of Miskjian's paper one worker said that he had had as good results from injection into the cavity of **Mercurochrome-220**. The reviewer can recommend the practice of injecting the cavity of a

bubo, after aspiration of the contents, with a 2 per cent solution of mercuriochrome, aspirating the excess after the solution has acted for about a minute. *Electrargol*, however, seems to act just as well. Painting a chaneroid with mercuriochrome solution is a method which is simple and often effective.

Electro-coagulation by the **Diathermy** current is recommended by Busagiu,⁴ who tried it in 39 cases and obtained healing in from 7 to 32 days. Pain disappeared immediately and supple scars were left, while complicating buboes resolved rapidly. The author insists on the importance of dealing with every sore present, however small; otherwise reinfection will result. Not only the sore itself but the healthy tissue immediately surrounding it should be destroyed. Perrin⁵ also testifies highly to the value of coagulation by diathermy. A local anæsthetic is hardly necessary unless the patient is nervous. The current employed is very feeble, just enough to produce a greying of the tissues, and sparks should be avoided. In situations where there is loose tissue around the ulcer the author excises the coagulated tissue and then sutures. In other parts, such as the glans penis, where this is impracticable, he applies *Aristol* powder and then a simple compress. He does not recommend electro-coagulation in cases of phagedæna. In this he is opposed to Busagiu, who says that in this complication coagulation proved more effectual than any other form of treatment.

REFERENCES.—¹*Jour. R.N. Med. Service*, 1927, xiii, 138; ²*Jour. Amer. Med. Assoc.* 1927, 1699; ³*Ibid.* 1926, 1437; ⁴*Jour. d'Urol.* 1926, Aug., 142 (abstr. *Jour. Amer. Med. Assoc.* 1926, Nov. 6, 1595); ⁵*Marseille méd.* 1927, Jan. 5, 11.

CHEST, SURGERY OF. (See also BRONCHIECTASIS; LUNG, NON-TUBERCULOUS INFECTION OF.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

During the war, wounds and infections involving the chest were treated on principles which governed operations on similar conditions in other parts of the body. Civil surgery has been slow in recognizing what can be accomplished by operation within the thorax. J. T. Morrison¹ draws attention to the surgery of the lung, and reminds us that while a 'sucking' wound is of grave omen, a widely-opened thorax permits of extensive operative procedures on the lung in comparative safety. Safety, according to Duval, lies in securing a wide opening into the chest, and as complete collapse as possible of the lung on that side. Morrison thinks, however, that Duval may not have realized to what an extent he diminishes the opening into the chest when he puts his hand in, or in drawing the lung out. Morrison refers to a great deal of interesting experimental work, and thinks that the gulf between the operations on animals and the application of the experimental results to man is both wide and deep. Reference is made to resection of the entire lung in 1906 by Macewen. The man is still alive and doing light work. Kümmell is referred to as having removed the whole of one lung for a primary carcinoma, but lost the patient six days later from an acute bronchitis affecting the remaining lung. The communication is summed up by quoting Lilienthal, who states that we have at our disposal in exploratory thoracotomy a simpler and more effective method of diagnosis than in exploratory laparotomy.

The *Lancet*² refers to the persistent inertia and lack of faith in the surgical treatment of *pulmonary tuberculosis*. The successful results of **Thoracoplasty** are bringing about a reconsideration of the rule that this operation is unjustifiable if artificial pneumothorax can be done. Pneumothorax gives the best results at the beginning of treatment, but its complications, and the fact that the lung expands again, make it ultimately less successful than thoracoplasty. The latter operation is applicable only to chronic cases, whereas artificial pneumothorax may be used in other cases as well. The modern tendency is

to confine rib resection to the minimum compatible with efficient collapse of the affected part, and to supplement this resection by evulsion of the phrenic nerve. The cases must be carefully selected. In all cases in which thoracoplasty is proposed, the lesion in the opposite lung must be anatomically unimportant, fibrotic in character, and absolutely inactive. Bérard and Dumarest³ contribute an article in the *Revue de Physiologie*, to which the *Lancet* refers as follows: "To sum up, their paper shows once more how much can be done in selected cases, by thoracoplasty and by phrenic evulsion, to ameliorate the condition or arrest the course of pulmonary tubercle after all other means have been tried, and when without surgical assistance the patient is doomed to a decline. Of those whose lives can thus be saved, from one-third to one-half are returned to health, fit to work, whilst an even larger proportion, being freed from infection, can enter again into home life without danger to those around them."

In performing thoracoplasty to bring about collapse of the lung by a falling inwards of the remaining soft structures, it is best to remove the posterior portions of the ribs, when the remaining portions will bend inwards on the costal cartilages. A long 'J'-shaped incision placed behind will expose the posterior half of the thoracic wall, and the ribs can be exposed and resected subperiosteally without much difficulty. The reviewer has seen Morriston Davies operating in this manner, and also many of his successful cases, which are alluded to in the *British Journal of Surgery*.⁴

Thoracotomy is usually performed for the purpose of exploring the lung, the mediastinum, or the diaphragm. José Arce⁵ recommends injections of morphine and scopolamine, and local anaesthesia to include all the skin which covers the rib to be resected, together with the adjacent intercostal spaces. The intercostal nerves should also be infiltrated, and to do this it is necessary to push the point of the needle upwards into contact with the inferior border of the rib. The resection of the rib or ribs is carried out subperiosteally in the orthodox fashion. The pleura is opened. A rib retractor, such as Tuffier's, is placed in the posterior portion of the wound, and a good view of the interior of the chest is obtained. The collapsed lung is brought to the surface and dealt with in accordance with the condition present.

Tudor Edwards⁶ thinks that thoracic surgery has made very great strides in the last twenty years. He believes there are two types of *malignant disease* which offer reasonable hope of radical treatment: (1) Localized endothelioma of the pleura; (2) The so-called alveolar carcinoma (as the latter arises in the neighbourhood of the middle of the lobe). In making a diagnosis prior to operation, not only should X rays be used in the anteroposterior directions, but true lateral and oblique skiagrams are often necessary. Further X-ray examinations should be made after the induction of artificial pneumothorax or the intratracheal instillation of lipiodol. Edwards rightly points out that it is difficult to decide before operation whether the growths are benign or malignant, and he believes that intrathoracic tumours should always be submitted to an exploratory thoracotomy, and furthermore, when exposed, whatever the appearances, (a) they should be punctured with a large-bore needle, and (b) a portion should be removed for microscopical examination. Seven cases are mentioned in this paper. The first was a case of chondrosarcoma of the 2nd, 3rd, and 4th ribs: intrathoracic removal with recovery. In this case the whole of the growth arose in the deep surface of the ribs and there was no external evidence of a tumour. A very accurate diagnosis was made before operation by means of X rays before and after artificial pneumothorax (*Plate VI*), and also by the employment of thoracoscopy.

In a second case a cyst (*Plate VII*) was removed from the left lower pleural

PLATE VI

INTRATHORACIC NEW GROWTHS



Fig. A.—Chondro-arcana in upper right thoracic cavity. A small black ring has been placed there for stereoscopic purposes.



Fig. B.—The same case as in *Fig. A* after induction of artificial pneumothorax. Note edge of collapsed lung internal to and away from tumour.

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PLATE VII

INTRATHORACIC NEW GROWTHS—*continued*

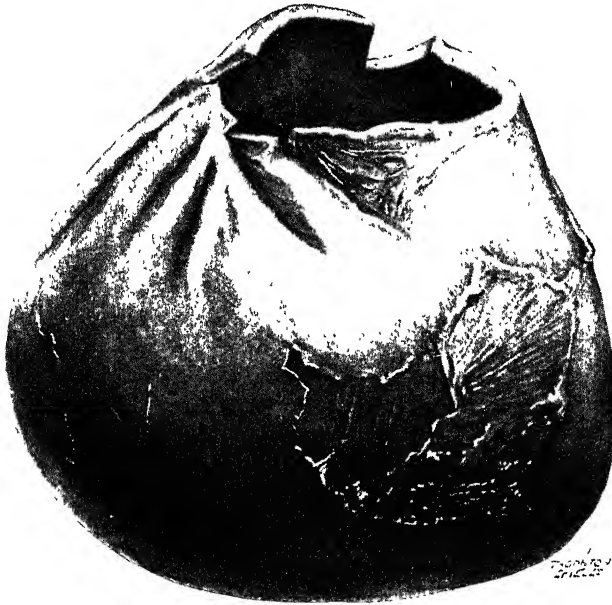


Fig. C.—Large cyst removed from left chest. Opening at apex shows where a small portion has been left behind on the pericardium, the lining being removed, and where sections have been cut for microscopy. ($\times \frac{1}{2}$)

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cavity. The first interesting feature about this case was the diagnosis. For three years it had been taken to be an encysted collection of fluid, probably tuberculous in nature. Edwards refers to the origin of the cyst as follows: "The other question of interest is the origin of the cyst. The absence of a true cellular lining makes exact diagnosis impossible. Is this a dermoid cyst arising in the anterior mediastinum and enlarging, which takes the line of least resistance into the pleural space, compressing the soft lung; or is it a primary diverticulum from the pericardium, the communication of which has become shut off as enlargement occurred? A definite answer is impossible, but its firm attachment to the pericardium is rather in favour of the latter. The loss of the lining membrane may have occurred owing to repeated hæmorrhages into the cyst, which also accounts for the excessive quantity of cholesterolin present." In one case Edwards performed the operation of removal of a teratoma in three stages. He thinks that there can be no doubt that the decompressive effect of the first operation resulted in the tumour being gradually extruded in a somewhat similar manner to the intraspinal tumours operated upon in two stages.

The writer summarizes his observations as follows: (1) A series of 7 operable intrathoracic growths is recorded. (2) Of these, 6 have recovered and have apparently been cured. (3) One patient in whom death occurred illustrates the possibility of primary lobectomy in suitable cases. Furthermore the risk of damaging the intercostal vessels is shown, especially when rib resection is used as a method of approach. Lastly, the case shows that intrapleural hæmorrhage may occur even in the presence of drainage without giving rise to any external evidence. (4) The value of operations in more than one stage is shown in two cases. (5) Endotracheal anæsthesia should be used where the pleura is free, but gas and oxygen by the ordinary method is better where adhesions are present. (6) The value of adequate X-ray examination is emphasized. Where possible, artificial pneumothorax should be done both as a diagnostic method and as a preliminary to operation, because the operative shock of opening the free pleura is reduced to a minimum in its presence. (7) Thoracoscopy, bronchoscopy, lipiodol injection, and bismuth-meal examination of the œsophagus may all prove valuable adjuncts to diagnosis and to subsequent treatment.

C. A. Hedblom and J. R. Head⁷ deal with the use of lipiodol in relation to thoracic surgery. Almost every aspect of the question is reviewed. One hour before the injection, to control the cough reflex, the patient is given from $\frac{1}{2}$ to 1 gr. of codeine hypodermically. About three-quarters of an hour later he is directed to bend over and rid himself of all accumulated sputum. He is then seated in a chair facing the operator, his neck painted with iodine, and with a fine hypodermic needle and 3 per cent novocain a dermal wheal is raised in the mid-line just above the cricoid. The infiltration is then carried to the level of the trachea, and with a slightly larger needle the trachea punctured and 4 to 5 c.c. of the 3 per cent novocain solution injected. This usually causes coughing, and it may be necessary to draw out the needle and reinsert it two or three times before the whole amount is instilled. While the novocain is taking effect, a tiny incision is made just through the skin with a narrow-bladed knife, and the lipiodol, which has been placed in a basin of warm water to bring it to the body temperature and decrease its viscosity, is poured into the syringe. Then, with the forefinger of the left hand acting as a guide on the cricoid, the trocar and cannula are inserted through the skin incision and into the trachea. The trocar is removed, and with an assistant steadying the cannula the syringe is fitted to it and the injection made. Before starting it the patient is told that coughing will spoil the result, and is asked to try very hard not to cough.

The position of the patient during the injection is very important. Gravity determines the portion of the bronchial tree into which the lipiodol flows. With the patient upright, most of the oil will go into the left lower bronchus. This cannot be counted upon, however. In case one wishes to inject the left lower bronchus the body should be inclined to the left at an angle of about 30 degrees. If it is desired to inject the right lower bronchus, the inclination should be to the right side. Both lower lobes can be filled by injecting part of the oil while the patient is leaning to the right, the remainder while he is leaning to the left. To fill the middle lobe the injection is made with the patient recumbent upon the affected side. Examination of an apex proves the most difficult. In some instances one can be filled with the patient in the recumbent lateral position. It can be reached more certainly if, immediately after the injection of the oil, the patient is held over the edge of the table in the lateral position and with the head slightly lower than the hips.

The amount of oil injected is usually 20 c.c. Forestier mentions having administered as much as 60 c.c. at one time. What the maximum amount of lipiodol may be that may be injected with safety at one time remains to be determined. Not infrequently one is able to outline the bronchial tree of one lobe with injection of no more than 20 to 30 c.c. and without producing symptoms. The skiagrams must be taken immediately after the injection. While usually the patient does not begin to cough for ten to fifteen minutes, there is always danger that he may do so, and consequently the sooner the picture can be taken the less are the chances of failure from this source. An example is shown in *Plate VIII, Fig. A*.

Referring to the *possible harmful effects from lipiodol*, the writers say that on first consideration the introduction of so large an amount of foreign substance into the finer ramifications of the bronchial tree seems a radical procedure. One might anticipate a severe immediate reaction, or that later complications in the nature of abscess, bronchiectasis, or fibrosis might result. At present all that can be said is that so far none have been observed. The patients do not cough during the injection. In the course of ten or fifteen minutes they have what is for most of them a normal coughing spell during which they raise most of the oil. This spell is not severe or protracted. A small amount of the oil remains in the alveoli and is gradually absorbed in the course of weeks or months. They have had patients in whom this oil had disappeared entirely in a week; in others it was still present in part after several months. It is expelled from abnormal pulmonary cavities more readily than from the terminal bronchi of the normal lung. They have not used the oil in a patient who did not have a cough before the injection. In those patients in whom they have used it—and they have often injected large areas of normal lung—the pre-existent cough has either lessened or remained unchanged. In none have they been able to note any ill-effects.

Regarding the interpretation of *skiagrams*, Hedblom and Head state that as yet but little can be said. In many of the plates the findings are definite, but it is probable that interpretation is not as simple as it may seem. Sergeant has noted sacculations in emphysema which are with difficulty distinguished from those in bronchiectasis. Ballon has called attention to the occasional failure of filling of an abscess. There is always the chance that the oil will not flow into the affected area. One factor which will always have to be considered is that the picture varies with the amount of oil injected. If the patient coughs before the exposure there results a rather characteristic picture. Compared with the normal it is much as if one had brushed his hand across a finely drawn etching while it was still wet—often such pictures are entirely unintelligible.

PLATE VIII

LIPIODOL AND THORACIC SURGERY



Fig. A.—Multiple empyema cavities. Skiagram taken after injection of lipiodol into a draining sinus in the chest wall.

By kind permission of 'Annals of Surgery'



Fig. B.—Long narrow sinus blocking drainage of cavity.

By kind permission of 'Surgery, Gynecology and Obstetrics'

[The reviewer has seen difficulties arise in connection with the injection of lipiodol below the cricoid. On the other hand, 'tranquil tracheotomy', as recommended by StClair Thomson, has been most successful. In the same manner the tracheal rings can be exposed under local anæsthesia, prior to the injection of lipiodol, with the greatest ease. Five to fifteen minims of a 2·5 per cent solution of cocaine are injected into the tracheal lumen between two rings with an ordinary hypodermic syringe. The syringe is so held that the forefinger resting on the needle prevents the point from entering further than about half an inch. A short spasm of coughing results, but this soon subsides. After an interval of about ten minutes the trachea is anæsthetized, and the lipiodol may be injected or the trachea opened in absolute tranquillity. (See MEDICAL ANNUAL, 1921, 471.)—W. I. de C. W.]

J. D. Lawson⁸ also draws attention to the use of Iodized Oil in the demonstration of empyema cavities and fistulous tracts (*Plâte VIII, Fig. B*). In the injection of all cavities aseptic technique must of course be used. A patient should be observed rather closely to prevent overdilatation and the possible rupture of a walled-off inflammatory process, which accident might result in the dissemination of infection. The procedure is absolutely painless to the patient and he has as yet heard no complaint. The shadow may remain present for weeks or even months. Symptoms of iodism have never appeared in any patients of the series on which he bases his paper, although as much as 50 grm. of iodine have been injected at one time.

† REFERENCES.—¹*Brit. Jour. Surg.* 1926, July, 94; ²*Lancet*, 1927, i, 1089; ³*Rev. de Physiologie médico-sociale*, 1922, April; ⁴*Brit. Jour. Surg.* 1925, July, 58; ⁵*Surg. Gynecol. and Obst.* 1926, Sept., 355; ⁶*Brit. Jour. Surg.* 1927, April, 607; ⁷*Ann. of Surg.* 1927, Feb., 194; ⁸*Surg. Gynecol. and Obst.* 1927, Jan., 11.

CHICKEN-POX.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—Cases of concurrent herpes zoster and varicella have recently been recorded by A. C. Roxburgh and P. H. Martin,¹ E. C. Willcox and J. D. Rolleston,² Lévy-Valensi, Feil, and Salle,³ and R. L. T. Grant.⁴ Commenting on Willcox's case the reviewer points out that by far the most frequent association of herpes zoster and varicella is the occurrence of zoster in one individual followed by the eruption of varicella in another, usually after an interval of about fourteen days, corresponding to the incubation period of varicella. A much rarer association is the occurrence of varicella in one individual followed by the appearance of zoster in another with whom he had been in contact, of which only 10 examples were collected by A. Netter in 1920 and 15 by H. Netter in 1921 (see also MEDICAL ANNUAL, 1927, p. 89). Intermediate in frequency is the group of cases, of which Willcox's patient was an example, consisting in the concurrence of zoster and varicella, of which H. Netter has collected 21 cases. While some writers regard the concurrence of varicella and zoster as due to dissemination of a virus which in the first instance attacks certain posterior nerve-roots only, the reviewer adopts the more obvious explanation that in view of the extraordinary frequency of varicella and the comparative rarity of zoster, there is nothing remarkable in the occasional association of the two diseases, although the association is a mere coincidence.

E. Gordon and J. D. Rolleston⁵ record a fatal case of bullous and gangrenous varicella in a male child, age 2 years and 11 months. On admission to hospital on the third day of disease, the temperature was 104°, pulse 144, and respiration 44. Scattered over both lumbar regions, the left buttock, both thighs and legs were sixteen hæmorrhagic bullæ varying in size from that of an ordinary chicken-pox vesicle to that of a shilling. Death took place on the sixth day of disease, by which time the bullæ had become flattened, with the

exception of four on the calves which were still filled with a purulent fluid. The rest were dark in colour and presented a definite necrotic ring which invaded and undermined the surrounding tissue. Post mortem the necrotic areas showed a cone-shaped patch of hæmorrhage, the apex of the cone pointing towards the deeper fascia, which was ulcerated. The bases of the lungs had reached the stage of red hepatization. Commenting on the case, the reviewer remarks that though varicella is rightly regarded as one of the most trivial disorders, Trousseau's dictum that no physician had ever seen a child die of the disease apart from a complication entirely unconnected with the exanthem is no longer applicable. Fatal cases of chicken-pox, however, are extremely rare, and are usually examples of the gangrenous or hæmorrhagic variety. In the course of more than twenty-five years' fever-hospital practice this was only the third fatal case the reviewer had seen, the first being one of confluent bullous varicella and the second of the gangrenous type. (He has recently seen a fourth fatal case in an alcoholic man of 60, complicated by pneumonia.) Comparatively few cases of varicella bullosa have been recorded since it was first described by Cross, of Norwich, in 1820, and, with the exception of a case reported by Comby, none have been particularly severe.

R. E. Wilson and F. R. Ford⁶ have collected twelve cases of *encephalomyelitis* complicating varicella, including the cases recently reported by Winnicott and Gibbs (see MEDICAL ANNUAL, 1927, p. 88). The nervous symptoms developed between the fourth and fifteenth days of disease. The signs pointed to an involvement of the brain-stem and spinal cord, and included ophthalmoplegia, nystagmus, vertigo, vomiting, tremors, choreiform movements, spastic weakness of the legs, and sphincter disorders. Sensory loss was unusual. Recovery was complete, or nearly so, in every case. There were no deaths, so that the morbid anatomy is unknown.

J. Sabrazès⁷ reports the first case on record of *orchitis* occurring in varicella. The patient was a man, age 20, in whom all other causes of orchitis could be excluded. The complication developed during the first few days of the disease, first in the left testis, and then in the right. Under treatment by rest and sedatives complete recovery took place.

REFERENCES.—¹*Brit. Jour. Derm. and Syph.* 1926, July, 286; ²*Brit. Jour. Child. Dis.* 1926, Oct.-Dec., 270; ³*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1926, Dec. 30, 1750; ⁴*Med. Jour. of Australia*, 1927, i, 192; ⁵*Arch. of Pediatrics*, 1927, 337; ⁶*Bull. Johns Hop. Hosp.* 1927, xli, 337; ⁷*Bull. de l'Acad. de Méd.* 1927, xcvii, 122.

CHILBLAINS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

H. W. Barber¹ discusses the treatment of this troublesome condition. He first refers to the underlying condition of acrocyanosis or 'chilblain circulation'. He recognizes two types of acrocyanosis: (1) That occurring in fat subjects, usually females between 15 and 25 years of age, though it may be found at a later age; and (2) That occurring in thin subjects and not confined to one sex, and which may begin in early childhood. In (1) the cutaneous vascular stasis is most marked on the posterior surface of the upper arms and the legs below the knees; there is well-marked keratosis pilaris, often with circumfollicular halo; the skin is bound down to the subcutaneous fat, and both it and the underlying tissue give the impression of being œdematous. In severe cases, actual œdema of the lower part of the legs, ankles, and feet may occur. He considers the factors responsible for this condition are uncertain at present, but finds the majority of patients lead a sedentary life and that their diet is lacking in fresh vitamin and mineral-rich food; these, together with endocrine disturbance, chronic septic absorption, and intestinal toxæmia, may all play a part. In (2) the patients are of a nervous and emotional temperament, in contrast with the phlegmatic calm of the first type. Faulty stance,

visceroptosis, and loss of vasomotor tone are present, and static albuminuria is sometimes found. This type is more susceptible to infection, so that persistent nasopharyngeal catarrh, recurrent attacks of tonsillitis, and tuberculosis are common.

Both these classes are the common subjects of chilblains, but it is not altogether clear as to what further factors are necessary for their production. The influence of cold, especially when associated with dampness, is obvious, but whether the mere physical action of cold alone is sufficient in itself to produce the lesions of chilblains is open to question. The author considers that there is considerable clinical evidence that chilblains may actually be due to bacterial embolism or to the action of bacterial toxins on the cutaneous vessels, thus bringing them into line with erythema multiforme, erythema nodosum, erythema induratum, and lupus erythematosus. He further quotes Wright's view that these cases may be due to lowered coagulability of the blood, which allows transudation of plasma through the vessel walls and is associated with a deficiency of calcium. In association with W. Payne he finds that in the fat type, referred to above, the ionizable calcium was not deficient, and he also finds that the symptoms are not relieved by **Calcium Lactate**. On the other hand, administration of this drug with **Parathyroid** was often effective in lessening the tendency to chilblains in the thin type of patient.

As regards treatment, it is necessary that all patients should undergo a thorough physical examination so as to discover any evidence of tuberculosis and chronic focal infection. The necessary general or local measures of treatment should be applied to deal with these. Diet should be modified to suit the patient's mode of life and to ensure an adequate supply of fresh food containing mineral salts and vitamins; green vegetables and mixed salads, fruit (particularly apples), wholemeal or Swedish bread, with plenty of butter, eggs, milk, cheese, cream, and a moderate quantity of freshly cooked meat and fish, should form the basis of a normal diet. In cases of excessive intestinal putrefaction, meat and fish should be reduced to a minimum and the quantity of carbohydrate and fresh vegetables and fruit increased. Conversely, in those with intestinal fermentation and excessive acid production, all soft starchy and concentrated sweet foods must be excluded. **Physical Exercises** both general and local are of great value in improving the peripheral circulation. Of the local measures recommended, Jacquet's **Biokinetic Method**, of fixing the finger- or toe-joints by forcible muscular effort and holding them extended in an elevated position for five minutes several times a day, is found of value. **Galvanic Baths** in which the current is periodically reversed, and frictions with **Methyl Salicylate** or spirits of **Camphor**, are also suggested. **Heliotherapy** and **Artificial Sunlight Baths** have proved of great value, and the author considers this due to the action of light on the sympathetic and certain of the endocrine glands. Patients with chilblains should, he advises, keep the extremities warm with loose woollen gloves and stockings, but the rest of the clothing should be light and porous, and whenever possible vigorous outdoor exercise with the minimum of covering should be enjoined, so that the tonic effect of air and sunlight on the skin may be obtained.

With regard to drugs, the author finds that the fat type of case responds best to **Thyroid Gland**, pushed until the optimum dose is reached, combined with **Iodine** given internally in large doses. He uses the French tincture in doses from 5 drops twice daily up to as many as 60 drops in the day: the drug is given in milk. Colonic stasis is treated by the temporary administration of liquid paraffin. In the thin patient **Calcium Salts** are indicated. **Afenil**—a calcium-chloride-urea compound—may be given intravenously in 10-c.c. doses: six to eight injections at intervals of a few days are advised. Or

Crookes' Colloid Calcium may be administered intramuscularly, or Calcium Lactate 15 to 20 gr. three times a day an hour before meals. With this, Parathyroid Gland may be given, and Cod-liver Oil is of unquestionable benefit.

G. H. Percival and C. P. Stewart² have made observations on the calcium content of the blood in chronic erythema of the legs. They found no deviation from the normal of the serum calcium content in erythema pernio (chilblain), nor did they find any in chronic erythema of the legs. In two cases, in spite of a well-marked rise in serum calcium caused by the administration of parathyroid, no improvement in the patient's condition was evident.

L. J. C. Mitchell³ finds that Elastic Pressure on chilblains relieves the symptoms and causes rapid disappearance of the lesions. He has had made rubber bands of the thickness of medium surgical gloves, which can be applied over the affected fingers or toes so as to produce the desired elastic pressure. Well-fitting rubber gloves worn at night are equally useful. The pressure must be firm but not painful.

REFERENCES.—¹*Lancet*, 1926, ii, 1180 and 1232; ²*Brit. Jour. Dermatol. and Syph.* 1927, March, 115; ³*Med. Jour. of Australia*, 1926, Oct. 2, 449.

CHILDREN, SURGICAL DISEASES OF. (See APPENDICITIS; BURNS; DUODENUM, ATRESIA AND STENOSIS OF; HARE-LIP AND CLEFT PALATE; HIRSCHSPRUNG'S DISEASE; HERNIA, INGUINAL; INTUSSUSCEPTION; LUNG, NON-TUBERCULOUS INFECTION OF—SURGICAL TREATMENT IN CHILDREN; PYLORUS, CONGENITAL HYPERTROPHIC STENOSIS OF; PYURIA; SPINE, TUBERCULOSIS OF; TUBERCULOSIS, ABDOMINAL; TUBERCULOSIS OF BONES AND JOINTS.

CHOLECYSTOGRAPHY.

John H. Anderson, M.D.

Edmund I. Spriggs, M.D., F.R.C.P.

Though no outstanding advance has been made in this subject during the last twelve months, yet much valuable work has been done in consolidating the position already gained and in assessing the importance of the observations made possible by this new line of investigation. In America work has been carried out particularly with regard to the function and mode of action of the gall-bladder. In this country F. Davies¹ has published a notable paper on the variations in position and motility of the gall-bladder in normal individuals, particularly in relation to bodily habitus and gastric function.

Substances Used.—The use of sodium tetrabromphenolphthalein is being gradually abandoned, and practically all workers are using the iodine compound. E. A. Graham² introduced last year an isomer of sodium tetraiodophenolphthalein, known as Sodium Phenoltetraiodophthalein, for which it is claimed that 98 per cent is passed into the bile, the remainder being found in the urine. With this compound smaller doses can be given with equal results, and in consequence there is less chance of toxic reaction. Other advantages are a more rapid excretion, thus rendering the period of investigation shorter. Up to the present, however, difficulties of manufacture have made the compound very expensive, and sodium tetraiodophenolphthalein remains the drug of selection.

Max Einhorn, W. H. Stewart, and E. J. Ryan³ speak highly of a compound originated by B. O. Pibram known as Biloptin or Diiodoatophan. As the latter name indicates, it is a synthetic compound of atophan with certain iodides. The chemical formula given is $C_{16}H_9O_2NI_2$, and it is produced as a tasteless non-toxic yellow powder, soluble with great difficulty in water or alcohol. The usual routine of oral administration is followed, 4 to 5 grm. being given in cocoa and milk or in plain gelatin capsules. Good results were obtained in ten cases, including several in which sodium tetraiodophenolphthalein

was contra-indicated owing to cardiac disease. In four of the cases it was given by the duodenal tube with no ill-effect and with good results. The number of cases is too small to warrant conclusions, and further results will be awaited with interest.

T. Brugsch and H. Horsters⁶ seek to promote the absorption of the dye from the alimentary canal by adding trioxycholanic acid to the capsules. It is claimed that by this means the liver can also be visualized, a diseased liver showing itself by refusing to take up the dye. A. Lomon and P. Laurent-Gérard⁷ describe three sodium salts of tetraiodophenolphthalein and consider that 'le sel disodique' gives the best shadow with least disturbance. They regard this as due to the fine division of the salt, almost resembling a colloidal state.

Dosage.—The amount of drug used varies with individual workers, and to a certain extent with the route used. The tendency is, however, for the doses of the intravenous and oral methods to be much the same. Orally, W. H. Stewart⁴ uses 3.5 grm. for an individual weighing 150 lb., while Davies¹ gives as large a dose as 5 grm. S. Cade⁵ reflects general opinion as to the intravenous dose when he advises 3 to 4.5 grm., according to the size of the patient. It will be seen then that the intravenous dose is about 0.5 grm. below the oral.

Preparation of Patient.—More attention is being given to the preparation of the patient, as it is found better and more reliable results are obtained if this is done as a routine. Stewart and Ryan⁸ advocate a mild cathartic the night before, followed by an enema in the morning; D. P. D. Wilkie and C. F. W. Illingworth⁹ use liquorice powder, J. H. Mather and W. Robert Williams¹⁰ give a mild aperient. This course is advised whether the dye be given by mouth or into a vein. In addition Stewart^{8, 11} and V. Knapp¹² give a fat meal of the Boyden type (containing egg-yolk, milk, or cream) shortly before the administration of the dye to have the gall-bladder as empty as possible.

Preliminary Skiagram of Abdomen.—This is essential. A gall-bladder may give a shadow before the dye is given, and if there is no change in density after cholecystography it is shown that dye is not entering or not concentrating in the gall-bladder. If some dye does enter such a gall-bladder, the previous shadow plus the shadow caused by a small amount of entering dye may give an almost normal appearance. Again, the preliminary screening helps to separate shadows outside the gall-bladder such as renal calculi or calcified cartilages, etc.^{8, 9, 11, 13}

Routes of Administration.—The duodenal tube is being less used, and at present almost all cases receive the dye intravenously or orally. Graham^{2, 11} still adheres to the intravenous method, as does E. W. Lipschutz¹⁵, Whitaker,¹¹ and others.^{3, 9} On the other hand, the oral method has many stout adherents, among whom may be numbered A. B. MacLean¹⁶, J. G. Mateer and W. B. Henderson,¹⁷ P. G. McEvedy and J. E. Sheret,¹⁸ and others.^{1, 8, 10, 11, 12, 13} In cases controlled by operation, Graham¹⁴ reviewed a large number of cases from various sources and found the intravenous method correct in an average of 95 per cent, and the oral in 89 per cent. In his own hands findings by the intravenous method were correct in 98 per cent, and in one series the oral method was accurate in 94 per cent.¹⁰ It would appear from these figures that the intravenous method can be made a little more accurate, but it has certain inherent disadvantages which lead many workers to prefer the oral route. It is agreed that the dye must be used as soon as possible after preparation, and at all times be protected from exposure to air and light.⁸

Intravenous Method.—A full description of this method is given in the MEDICAL ANNUAL, 1927, page 183.

Oral Method.—Mather and Williams¹⁰ describe the technique which in their hands has yielded excellent results as follows: "Twenty-four hours before administering the drug the patient is given an aperient, preferably one ounce of castor oil. On the day preceding the examination the patient takes an ordinary diet containing fats. No food is allowed after 6 p.m., and no further aperient is given. Between 9 and 9.30 p.m. the capsules are swallowed whole with sips of water. (For an average patient fifteen capsules are taken—that is, 4.5 grm. of the salt.) At 9.30 the following morning the first radiogram is taken, using the Potter-Bucky diaphragm, the patient being in the prone position. The patient returns at 12.30 p.m., and the second radiogram is taken. If the gall-bladder appears normal at both these examinations, the patient is told to take a meal containing fat and to return between 3 and 4 p.m. for a third radiogram. Should the gall-bladder be empty or nearly so, the examination is concluded. If it has not emptied, the patient is asked to return the following day. But in those cases where there is no suggestion of a gall-bladder shadow on both the 9.30 a.m. and 12.30 p.m. radiograms, the examination is carried no further and a 'pathological gall-bladder' is reported. If the gall-bladder is normal, a definite shadow is visible on the radiogram taken twelve hours after administering the dye. At the end of fifteen hours the shadow is denser and usually smaller. The radiogram taken two or three hours after the meal containing fat shows either no gall-bladder shadow or one very much reduced in size. If the gall-bladder is not markedly smaller, the patient is examined the following day."

As the dye is a gastric irritant, various expedients are employed to enable it to pass through the stomach unabsorbed. The salol-coated pills formerly advocated are being given up as not reliable, and variously covered gelatin capsules substituted. T. I. Bennett and his co-workers¹³ and Matcer and Henderson¹⁷ use formalin as an outer covering, but keratin is generally recognized as being more suitable^{8,10}: "0.3 gr. of the salt is placed in a gelatin capsule, which is then given three coats of a keratin solution made (using Merck's keratin) according to the *British Pharmaceutical Codex* formula. The capsules are allowed to dry in the air without heating. . . . It is important (a) that the salt be obtained as fresh as possible and carefully stored, and (b) that the capsules be made up freshly. If capsules are kept for more than seven days the coating is not dissolved readily in the small bowel".¹⁰

In most clinics the giving of bicarbonate of soda between the injection of the dye and the first skiagram has been omitted, but the patient should remain quiet and move about as little as possible. If possible he should be kept in bed during this interval.

Reactions.—It is generally conceded that toxic symptoms are less after oral administration.^{7, 8, 10, 13} Graham,¹⁴ using sodium tetraiodophenolphthalein intravenously, had reactions in 67 per cent of cases, mostly slight and transient. There was a reduction to 50 per cent when the isomer phenoltetraiodophthalein was employed. No further fatal cases have been recorded,* but Cade⁹ reports alarming symptoms in two cases, ascribed by him to the too rapid injection of dye which had deteriorated from exposure. Such cases are best treated by stimulants by the mouth, warmth, and the hypodermic injection of adrenalin 1-1000. Foments should be applied locally to the area if any leakage has

* LATE NOTE.—B. M. Dick and V. G. H. Wallace record a case of "acute hemorrhagic pancreatitis which followed immediately after an intravenous injection" and ended fatally, a case of jaundice which recovered; and a case "in which death occurred in a young jaundiced patient within thirty hours of the oral administration of the sodium salt". (*Brit. Jour. Surg.* 1928, xv, 360.)

taken place at the site of injection. Aspirin generally relieves the headache noticed at times after oral or intravenous administration.

Contra-indications.—Cases of renal and cardiac disease must be carefully considered before cholecystography is undertaken.^{10, 16} Jaundice is no longer looked upon as a contra-indication in itself, but cases presenting advanced liver cirrhosis and secondary carcinoma should not be submitted to the test.¹⁰ Oral administration is not safe in cases of pyloric obstruction.

MacLean¹⁶ considers diabetes to be a contra-indication, and W. Lintz¹⁹ had a severe reaction in a case of this disease; his case is interesting in that operation showed a congenital absence of the gall-bladder, also because medical treatment of an infected liver and bile-ducts was followed by the disappearance of the diabetic symptoms. In this respect Lintz's case resembles one described from the Ruthin Castle clinic by C. D. Shapland²⁰ in which the removal of a diseased gall-bladder, containing several stones, was followed by the relief of the previous diabetic state.

Method of Radiography.—A clear view must be obtained of the gall-bladder, unobscured by spine or distended bowel, and this calls for patience and a careful technique in the taking of the films. Stewart⁸ advises a gas tube, compression, and a Potter-Bucky diaphragm; but Davies¹ considers that the type of tube does not matter, though he insists on the diaphragm. Melville's procedure quoted by Davies may be regarded as typical and is as follows: "The tube should be centred over a point about a hand's breadth to the right of the spine of the second lumbar vertebra. The radiogram is taken postero-anteriorly, that is, abdomen towards film, and at the end of inspiration. The use of an immobilizing band is of no definite advantage. Tube condition: 30 ma., 5-in. spark gap; tube distance 36 in.; exposure 4 to 6 seconds (depending on size of individual)".¹ If the oral method has been used, an examination of the rest of the alimentary canal is essential to detect any unabsorbed dye.¹³ A point that is often overlooked is the emptying of the gall-bladder. This is important, as at this stage it is often possible to detect adhesions and small non-opaque stones which would otherwise be missed.^{8, 11}

At Ruthin Castle, films are taken at the filling stage, 12 hours after taking the pills; when the gall-bladder is full, at 15 hours; after food, at 18 hours; when the gall-bladder is nearly empty, at 20 hours. The exposure formula varies so as to permit of a $\frac{1}{2}$ -second exposure in all patients, using the Potter-Bucky diaphragm. In stout patients only the exposure is made at the end of inspiration. Films are taken prone and standing at each interview. In addition one film is taken in the supine position, to show the neck of the gall-bladder, the patient being tilted slightly over to the right, or alternatively the tube centred over the left transverse process of the second lumbar vertebra. An opaque meal is given at the 15-hour stage and the patient manipulated into various oblique aspects, in order to determine the mobility of the gall-bladder, in relation to adjacent hollow viscera. (O. A. Marxer, personal communication.)

Interpretation of Results.—As more cases are coming to operation it is found that one of the essentials for a correct interpretation of results is the development of, and strict adherence to, a routine procedure through the whole of the operation of cholecystography. No standard technique has been devised, as may be seen by the divergent opinions quoted above, but it is established that the best results are obtained where the operator keeps closely to the method of procedure he has elaborated. Standards of normality vary, particularly in regard to density of shadow, with variations in technique. The following variations of the shadow may be met with:

1. *No Shadow.*—This is the most important finding,² and may be due to

(a) blocked cystic duct (intrinsic or extrinsic)—stone, growth, stricture; (b) obliterated lumen of gall-bladder; (c) gall-bladder full of stones, mucus, or inspissated bile; (d) impaired liver function; (e) a gall-bladder whose mucous membrane has been destroyed by old inflammation or catarrh; (f) blocked common duct. In the case of oral administration must be added (g) failure of dye to be absorbed, and (h) deranged succus entericus or gastric juice.^{5, 6, 8, 16}

In this connection a warning must be given. In 6 cases out of 50 Wilkie and Illingworth⁹ found at operation normal gall-bladders which had failed to give a shadow by intravenous cholecystography, and consider this due to a temporary kinking of a normal cystic duct. (This point has been discussed in the *MEDICAL ANNUAL*, 1927, p. 177). Working with the oral method, Davies,¹ in his series of 100 cases, found that, of 15 gall-bladders which failed to fill at the first examination, 9 gave good shadows when the test was repeated some weeks later using precisely the same technique. In addition, a smaller number of cases which gave good shadows at the first examination gave no shadow when examined a second time. He considers the explanation lies in a variation in any one or other of the physiological factors which are necessary for the production of a good shadow, e.g., rate of absorption and excretion of dye, the entrance of sufficient dye into the gall-bladder, and its degree of concentration there. It is the case, then, that a normal gall-bladder may in certain circumstances, which are at present unknown, fail to give any shadow. In consequence failure to fill or absence of shadow should not be accepted till a second examination has been made.^{8, 10}

Stone is generally regarded as one of the most common causes of a non-filling gall-bladder, but it must be noted that a good shadow may be obtained even when stone is present.^{8, 9, 10, 18} (This is understandable if Aschoff's theory of formation of the aseptic stone is accepted.) The greatest hope of detecting these cases lies in the routine examination by X rays at the emptying stage. In addition to stone, Wilkie and Illingworth⁹ have found lipoid papilloma (one case), mild chronic cholecystitis (three cases), and catarrhal cholecystitis (three cases) in patients who gave apparently normal shadows. L. R. Chandler and R. R. Newell²¹ have had a somewhat similar experience; and conclude that a normal cholecystogram does not necessarily mean a normal gall-bladder.

2. *Persistent Shadow*.—Stewart and Ryan⁸ consider that a persistent shadow means a pathological gall-bladder in all cases. It is difficult to accept this, for, as Knapp¹² points out, the cause is something which allows bile to enter the gall-bladder, does not interfere with concentration, but is of such a nature as to prevent the concentrated bile passing out. He suggests a mechanical cause such as a ball-valve stone lodged in the cystic duct or Hartmann's pouch. A temporary kinking of the cystic duct would act in a like manner. Whilst it is admitted that in the majority of cases of persistent shadow there is disease of the gall-bladder itself, it is suggested that in some instances a non-septic mechanical cause, as just postulated above, may be present. Whether this distinction is of any importance in treatment must be decided in each individual case. Chandler and Newell²¹ consider there is disease present in a gall-bladder which fails to empty after a fatty meal.

3. *Faint Shadow*.—These cases present the greatest difficulty in interpretation,⁹ and are responsible for most of the errors.² Variations in density of shadow are almost invariably due to failure of the gall-bladder to concentrate the bile normally,⁸ and this in turn is caused by past or present inflammation involving the mucous lining. Most cases of chronic cholecystitis fall into this group. Occasionally a faint shadow is due to a non-septic obstruction which does not allow the entrance of sufficient dye to give a normal shadow even though concentration is normal. Faintness and persistence of shadow often

go together.¹¹ A mottled shadow can be produced by stone, or by gas in a piece of overlying bowel.

4. *Late Appearance of Shadow*.—This is an uncommon abnormality; it is regarded as due to a pathological state of the gall-bladder.

5. *Abnormal Contour or Position of Shadow*.—Irregularity of contour may be caused by pressure, diverticula, or adhesions. The radiologist is of great help in these cases by rotating the patient and taking films at different angles and positions. Where pressure is suspected, the barium meal should be combined with cholecystography. Evidence of adhesions is often best seen during the emptying stage, and as a rule is easy to detect; though in one series of operated cases it was found that smoothness or irregularity of the shadow outline did not correlate very well with the absence or presence of adhesions.²¹ Cade, in a very careful and comprehensive review, considers that a shadow above the twelfth rib is an indication of abnormality, probably due to adhesions, and notes that these high shadows are generally more spherical and smaller than those normally placed. "A small round shadow situated between the eleventh and twelfth ribs well away from the transverse process" indicates cholecystic disease.⁵ The shadow of the gall-bladder as seen in cholecystography presents many variations, and attempts are being made to interpret them in physiological rather than anatomical terms.

Miscellaneous.—MacLean¹⁶ draws attention to the variation in the composition of gall-stones in various places. In Glasgow, where he works, the gall-stones are poor in calcium, and so the direct method of detecting them is of but little use. Lipschutz¹⁵ advocates the use of Exicol in emptying the gall-bladder. It is a compound made up mainly of oleic acid and bile salts, and is as useful as, and more palatable than, the Boyden meal.

Cholecystography in the Study of the Normal Gall-bladder.—It is known that the normal gall-bladder may vary in shape, size, and position. Davies¹ has investigated this point carefully and has correlated certain of these variations with different types of individual. His subjects were "students, whose ages varied from 18 to 30 years. They comprised eighty males and twenty females, and were classified after the manner of Mills into the following types of bodily habitus :—

1. *Hypersthenic*.—Massive physique, great body weight, heavy bony framework, short wide deep thorax, relatively long abdomen of greatest capacity in upper zones, subcostal angle very obtuse, lungs wide at bases and contract sharply to apices which project but little above clavicles, long axis of heart nearly transverse, alimentary tract high in position, gastric motility fastest and tonus most marked of any type (stomach emptying time about 4 hours 22 minutes), colon high and short, caecum well out of iliac basin (even standing), transverse colon truly transverse, marked colonic tonus, and motility rapid. This group comprises about 5 per cent of individuals.

2. *Sthenic*.—Resemble hypersthenic but characters less marked; considerable body weight, rather heavy bony framework, thorax somewhat short and deep, lungs widest at bases, heart moderately transverse, subcostal angle about 90°, digestive tract high, with good tonus, and motility fairly rapid (stomach emptying time about 4 hours 46 minutes). This group comprises about 48 per cent of individuals.

3. *Hyposthenic*.—Frailty of build approaches that of asthenic type, visceral characteristics approach those of asthenics, but lack the extremely low position and peculiar form of such; tonus rather poor and alimentary motility somewhat slow (stomach emptying time about 5 hours 26 minutes); lungs intermediate in proportions, heart pendent. This group comprises about 35 per cent of individuals.

4. *Asthenic*.—Frail slender physique, light body weight, delicate bony structure, long narrow thorax, short abdomen of least capacity in upper zones, marked disproportion between great pelvic capacity and capacity of upper abdomen (pelvis may be as wide and capacious as that of a hypersthenic of twice the body weight); subcostal angle narrow, lungs widest in upper zones, and apices extend well above clavicles, heart pendent ("drop-heart"); gastro-intestinal tract low, stomach often largely pelvic when standing, colon long, caecum capacious and low in pelvis, poor tonus and motility slowest (stomach emptying time about 5 hours 43 minutes, and often not empty after 6 hours). This group comprises about 12 per cent of individuals.

Radiograms of the gall-bladder were taken, after administration by the mouth of sodium tetraiodophenolphthalein, and the following deductions may be made: (1) The length of the gall-bladder shadow is not definitely related to the type of bodily habitus. (2) The breadth of the gall-bladder shadow is greater in the 'better' types of bodily habitus (that is, in the hypersthenic and sthenic types). (3) The neck of the gall-bladder shadow lies at a higher level and at a greater distance from the mid-line of the vertebral column in the 'better' types of bodily habitus. (4) The fundus of the gall-bladder shadow lies at a higher level and at a greater distance from the mid-line in the 'better' types of bodily habitus. (5) The rate of emptying of the gall-bladder (as indicated by the extent of reduction in the size of the shadow at sixteen and a half hours—that is, two hours after taking a fatty meal) is quicker in the 'better' types of bodily habitus. (6) The respiratory excursion of the gall-bladder shadow is greater in the 'better' types of bodily habitus."

Some of this work is supported by Knapp.¹² The fact that a relation is established between gastric motility and emptying of the gall-bladder is interesting in supporting the thesis that the discharge of bile is directly influenced by variation in tone of the duodenal wall.

Summary.—Cholecystography is established as a safe procedure provided proper precautions are observed. Within certain limitations it is a reliable guide to the working of the gall-bladder, and by means of it a diagnosis can often be made when not possible otherwise. It requires a careful technique, closely followed. Sodium tetraiodophenolphthalein is the dye most frequently used, given orally or into a vein. More attention is being directed to the preliminary preparation of the patient and the study of the gall-bladder during the emptying stage. Reactions are fairly frequent but not severe, and oral administration produces the smallest disturbances. Contra-indications are few. Abnormalities detected are being translated in terms of physiology. Cholecystography is being used for the study of the normal gall-bladder.

REFERENCES.—¹*Brit. Med. Jour.* 1927, i, 1138; ²*Amer. Jour. Med. Sci.* 1926, Nov., 625; ³*Med. Jour. and Record*, 1927, April 6, 457; ⁴*Boston Med. and Surg. Jour.* 1927, March 31, 509; ⁵*Lancet*, 1926, ii, 1; ⁶*Jour. Amer. Med. Assoc.* 1926, Oct. 16, 1343; ⁷*Presse méd.* 1926, Aug. 21, 1060; ⁸*Brit. Jour. Radiol.* 1927, April, 119; ⁹*Brit. Med. Jour.* 1927, i, 613; ¹⁰*Ibid.* 614; ¹¹*Boston Med. and Surg. Jour.* 1927, March 31, 509; ¹²*Med. Jour. and Record*, 1927, March 2, 307; ¹³*Lancet*, 1926, ii, 19; ¹⁴*Surg. Gynecol. and Obst.* 1927, Feb., 153; ¹⁵*Med. Jour. and Record*, 1927, March 2, 321; ¹⁶*Glasgow Med. Jour.* 1926, Sept., 153; ¹⁷*Arch. of Internal Med.* 1926, Dec. 15, 708; ¹⁸*Lancet*, 1927, i, 1119; ¹⁹*Amer. Jour. Med. Sci.* 1927, May, 682; ²⁰*Lancet*, 1927, i, 758; ²¹*Jour. Amer. Med. Assoc.* 1927, May 14, 1550.

CHOLERA.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY.—A. J. H. Russell^{1,2} has continued his mathematical studies by means of 'periodogram analysis', and concludes that rainfall and temperature seem to have little association with cholera; humidity has a fairly high positive association; when the rainfall and pressure effects are constant, temperature has a fairly significant negative correlation with cholera; increase of pressure is associated with a reduction in the incidence of cholera; when temperature effects are ignored, the association of humidity with cholera is highly significant. He says it is "fairly conclusive that high humidity is favourable to a high incidence of cholera, while pressure is associated in exactly the opposite manner"; and further, after referring to Rogers' work showing that an absolute humidity over 0.400 favours the development and spread of cholera in India, and that the endemic areas for the disease all have a constant absolute humidity above this figure (see MEDICAL ANNUAL, 1927, p. 90), he adds: "These conclusions coincide with the results obtained in the present investigation". In a third paper, by A. J. H. Russell and E. R. Sundararajan,³

forecasting of epidemics of cholera is studied on the lines of Bundesen and Hedrich's recent work on scarlet fever in Chicago, and their conclusions are found to be largely applicable to cholera in India. The endemic areas of cholera in India are also worked out, and they coincide as far as they go with those Rogers mapped out a year previously (*see* 1927 ANNUAL). They also give charts of the monthly variations of cholera incidence for different provinces for a short series of years, and come to the fairly obvious conclusion that, after low prevalence of the disease, a rapid rise in the incidence in two or three consecutive months over the previous ten-years' average monthly incidence indicates an approaching epidemic, which can thus be foreseen two or three months before reaching its climax.

Rogers,¹ in a paper which appeared two months before the last-mentioned one, deals with the 'forecasting and control of cholera epidemics in India' on the basis of a study of the records of the cholera incidence and meteorology of some sixty years for all the provinces and divisions of India, in the course of which over 70,000 data were tabulated. As a much fuller paper, with many maps and charts, is in the press, it need only be stated here that he concluded that, by watching the rainfall and humidity, cholera epidemics can be foreseen in India up to six months ahead, and that much might be done to control the spread of the disease by inoculating the pilgrims visiting endemic areas in epidemic years before they proceed on their dangerous pilgrimages, by which they bring back the disease to their own provinces.

TREATMENT.—J. W. Tomb² has repeated his claim that the slight modification of the very old Indian *Pro-diarrhoea Mixture* containing essential oils is an almost certain preventive of cholera and also cures 95 per cent of early cases, and he appears to regard practically every case of diarrhoea and sickness in Bihar as being potential cholera. Support for his views has been afforded by A. Cannon³ working in Canton. G. O. F. Sealy⁴ points out that Cannon is incorrect in attributing the initiation of the essential oil treatment to Tomb, as it was described by him on June 10, 1922, and was only a very slight modification of the thirty-year-old Government medical stores 'pro-diarrhoea mixture'. S. R. Bharati,⁵ however, had a mortality of 50 per cent in his cholera cases treated with *mistura pro-diarrhoea* and one cholera pill without opium, and only 16.6 per cent on adding 2 gr. *Potassium Permanganate* pills every fifteen minutes to the essential oil mixture, although Tomb thinks permanganate useless. These differences of opinion only emphasize the necessity of carefully controlled tests, such as treating every other case under hospital conditions, in order to arrive at the true value of any proposed remedy.

J. W. Tomb and G. W. Thompson⁶ discuss the theoretical basis and results of Rogers' *Hypertonic Saline* treatment, and conclude that neither are satisfactory. They compare Rogers' death-rate of 32.6 per cent in the first trials of his hypertonic saline in Calcutta in the very serious class of patients admitted to hospital, with the mortality in village outbreaks, with a far larger proportion of mild cases, and they ignore Rogers' later mortality in 1429 hospital cases with a mortality of 20.8 per cent given in the very table they quote from, which the originator of that method in a note on the subject¹⁰ points out is calculated to prejudice his methods. He also points to confirmation of his work from both the theoretical and practical standpoints, which were not mentioned by his critics. K. L. R. Mallik¹¹ reports on 100 hospital cases of cholera treated by 'Rogers' saline treatment', including alkalis intravenously and permanganate orally, with only 17 deaths, although no less than 67 per cent of the patients were admitted in the collapsed stage, while of cases detected within the first twelve hours, only 6.1 per cent died, or as good results as Tomb claims in the milder village cases. Two of the deaths were in patients admitted moribund,

and five were from uræmia. R. C. Robertson and C. C. P. Anning¹² report on the treatment of 321 hospital cholera cases in Shanghai under 'Rogers' standard methods of treatment', with a mortality of 12.45 per cent, or better than those obtained by the originator of the method in Calcutta, doubtless due to the greater stamina of Chinese than Indian patients. Nearly three-fourths of the deaths occurred among those classed on admission as very severe. They also treated 47 foreigners by the same measures, with a mortality of only 17.02 per cent, and they conclude that cholera is no longer a very fatal disease when cases reach hospital in the early stages, and that uræmia and acidosis were the most serious complications. They describe and figure an ingenious small glass coloured bubble in a tube with protrusions on the inner wall of the glass, so that its movements backwards and forwards in this limited space indicate whether the saline is flowing into the vein. They show that the disease was water-borne, as the epidemic ceased when an impure Chinese waterworks was repaired and made efficient.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1926, July 1; ²*Ibid.* Oct., 409; ³*Ibid.* 1927, April, 901; ⁴*Jour. Roy. Soc. of Arts*, 1927, Feb. 18, 322; ⁵*Jour. Trop. Med. and Hygiene*, 1926, July 15, 210; ⁶*Brit. Med. Jour.* 1927, i, 98, ⁷*Ibid.* 985; ⁸*Ind. Med. Gaz.* 1926, Dec., 596; ⁹*Trans. Roy. Soc. Trop. Med. and Hygiene*, 1927, April, 516; ¹⁰*Ibid.* 522; ¹¹*Ind. Med. Gaz.* 1926, Oct., 489; ¹²*Jour. R.A.M.C.* 1927, May, 321.

CISTERNAL PUNCTURE. (See THECAL PUNCTURE.)

CLAW-FOOT. (See FOOT, DEFORMITIES OF.)

CLEFT PALATE. (See HARE-LIP AND CLEFT PALATE.)

CLUB-FOOT. (See FOOT, DEFORMITIES OF.)

CELIAC DISEASE.

Reginald Miller, M.D., F.R.C.P.

Leonard Parsons¹ has made an extensive study of the bone changes in this disease. In the usual type of case, with stunting of growth (coeliac infantilism), it is well known that the child remains not only short but very *petite*, with doll-like limbs whose bones are obviously thin and lightly built. This osteoporotic condition is present at an early age in coeliac disease, and Parsons regards it as a stage in the development of active rickets. It is also known that at a later age, usually not before the age of 7, a case of coeliac infantilism, unless it has been very strictly treated, may develop bony changes just like those of true rickets. The questions therefore arise, Are these changes truly rachitic, and if so, why are they so late in appearing? In Parsons' view these changes are to be regarded as those of true rickets, and to support this opinion he gives evidence resting on the clinical characters of the bone changes, the results of blood analyses, the skiagraphic appearances, and the results of treatment by ultra-violet light and irradiated cholesterol. His clinical results, it may be said in passing, based on this view of the condition, are eminently satisfactory. Why such rickets develops in coeliac disease at such a late age raises a very interesting point. It is thought, the osteoporosis apart, that the signs of active rickets appear late because, in coeliac disease, growth is retarded. According to this view rickets is not so much a disease of bone as a disease of *growing* bone. This explanation, which may readily be accepted, brings rather a fresh light to the consideration of rickets.

For many years it has been difficult for English investigators to follow what has been thought elsewhere about the disease which is in this country called coeliac disease. This is primarily an example of the old difficulties connected with different titles for the same condition in different countries; and hence

1. The first part of the document is a list of names and their corresponding addresses. The names are listed in a column on the left, and the addresses are listed in a column on the right. The names are: John Doe, Jane Smith, and Bob Johnson. The addresses are: 123 Main St, 456 Elm St, and 789 Oak St.

PLATE IX

CÆLIAC DISEASE



Fig. 4.—Cœliac infantilism in a child of 6. General nutrition fair. Buttocks small and flat.

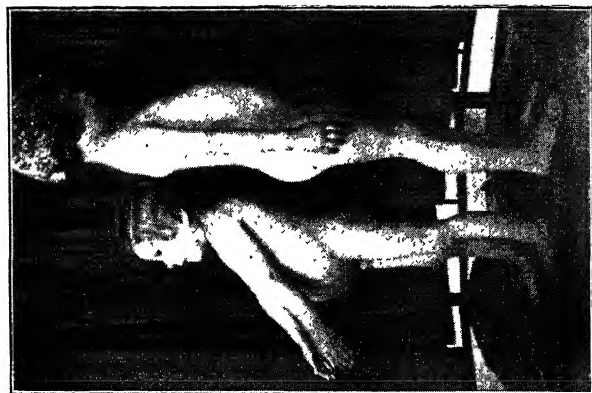


Fig. 5.—Cœliac infantilism in a child of 7. Plump, but much stunted in growth. Buttocks rounded but very small. (The taller of the two children is a normal child of 6 for comparison.)

By kind permission of 'Archives of Disease in Childhood'.

the great difficulty in tracing foreign work in any medical index. Lehnendorff and Mauter² have published a most extensive survey of the whole disease, giving us all the Continental work. It is by far the longest monograph yet written on the condition and is a most valuable piece of work.

The present writer³ has drawn attention to a sign which is sometimes of help in the clinical diagnosis of cœliac disease, namely, wasting of the buttocks (*Plate IX*). The differential diagnosis of cœliac disease lies most commonly between this disease and abdominal tuberculosis and chronic intestinal dyspepsia or toxæmia. A glance at the buttocks may often suffice: if they are small, flattened, and wasted, the diagnosis is almost certainly that of cœliac disease in a child past the age of infancy; if the buttocks are normal it is rather unlikely to be cœliac disease.

REFERENCES.—¹*Arch. Dis. in Childhood*, 1927, ii, 198; ²*Ergeb. der inn. Med. u. Kinderheilk.* 1927; ³*Arch. Dis. in Childhood*, 1927, ii, 189.

COLITIS, ULCERATIVE.

Robert Hutchison, M.D., F.R.C.P.

ETIOLOGY.—There is still much discussion as to the bacteriology of this disease. All are agreed that it is infective, but opinion is still far from unanimous as to whether or not the infection is a specific one. Louis A. Buie¹ is convinced that Bargaen's diplococcus (referred to in the ANNUAL, 1926, p. 98, and 1927, p. 93) is the cause. A. F. Hurst² is sceptical and inclined to doubt whether the ulcerative colitis described by Buie is really identical with the disease as seen in this country. Anthony Bassler³ thinks that many organisms may play a part in the production, but attaches chief importance to a streptococcus, which may, however, be associated symbiotically with the Welch bacillus or Bargaen's diplococcus. H. Schur⁴ regards the question of bacteriology as an open one.

TREATMENT.—Rest in bed is of the first importance, and should be continued until the sigmoidoscope shows that all ulcers are healed. Hurst says that this may take months or even a year! The Diet should be nourishing but unirritating. Subgallate of Bismuth in large doses and Tannic Acid Preparation (tannalbin) are the drugs most recommended, with small doses of Opium for the relief of pain. Opinion as to the value of Vaccines is still much divided. Buie claims good results from a vaccine prepared from Bargaen's diplococcus. Other writers have found them of no benefit. For local irrigation, plain Normal Saline, Acriflavine (1–10,000), and solutions of Tannic Acid (gr. 1 to 2, to 1 oz.) are most favoured. All septic foci should be eradicated. Transfusion is of value in severe cases with much anæmia and in preparation for operation. In severe cases, Cæcostomy is the operation of choice; others recommend Ileostomy, but an artificial anus is apt to lead to subsequent stenosis.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1926, Oct. 16, 1271; ²*Lancet*, 1926, ii, 1151 ³*Med. Jour. and Record*, 1927, Feb., 253; ⁴*Wien. klin. Woch.* 1927, June 9, 756.

COLON, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

A largely attended and representative conference of German surgeons has recently been held at Berlin,¹ and the development of the surgery of the colon during the last twenty-five years was debated at great length. The subject was opened by Nordmann. It is interesting, and in a way reassuring, to find that although for so many years German surgery was divorced from British and American progress, and went its own ways, nevertheless the methods used and the opinions held in Central Europe are remarkably similar to ours, as far as the surgery of the colon is concerned. The condition which seemed to interest the speakers most was *megacolon*. The treatment advocated was to take great pains to get the bowel empty, and then to resect in one stage. If

this is too severe, a cæcostomy may be necessary, or the resection may be divided into stages. According to Kleinschmidt, the cause of the condition lies in the colic branch of the sacral nerve. He has found it deficient in one human case, and section of the corresponding nerve in dogs causes obstipation with huge distention of the colon, which may be shown by the X ray. Bruening pointed out that there is an acquired condition of megacolon very similar to the congenital form. [I have recently had a case under my care, in an old lady, with vomiting, immense distention of the abdomen, and absolute constipation that could not be relieved either by aperients or numerous enemata. The rectum was empty. I have twice had to do a colostomy, at intervals of a year, to save her life. There was no organic obstruction and no fecal block.—A. R. S.]. In cases of *cancer of the colon*, the modern German mortality after operation is 28 per cent, and 64 per cent are alive and well three years after.

Polyposis of the Colon.—This rather uncommon disease continues to provide interest. Sir William Wheeler² describes and illustrates several cases. One presented symptoms like those of ulcerative colitis. The other was associated with infantilism, and suffered from bloody diarrhoea of long standing. Sigmoidoscopy and X-ray examination give little help, but the polypi may often be felt per rectum. At operation the colon feels thick and heavy and has lost flexibility. Colectomy is the only useful treatment. The polypi are very apt to become malignant.

Ileocæcal Tuberculosis.—A tuberculous mass in the cæcum is usually best treated by resection. According to Chabrut,³ 10 out of 40 cases died after operation, some at once, some within two months. Of the remaining 30, 6 are lost sight of; 15 are dead—2 of unconnected causes many years after, and 13 of tubercle; 9 are alive; 7 are well; and 2 show signs of intestinal tubercle. The cases have been followed from six months to nineteen years.

Colostomy.—There was a discussion on this subject at the Royal Society of Medicine in May, 1927, in which W. E. Miles⁴ and many other surgeons took part. The general consensus of opinion may be summarized as follows. A good colostomy nowadays is not nearly as terrible an infliction as many doctors think. A patient recently cycled from Bedford to London with a colostomy, and many people in every big town carry on their business in spite of it, without anyone noticing anything unpleasant. The highest piece of pelvic colon available is to be used, to prevent prolapse of bowel afterwards, and the opening should be in the rectus muscle, because its fibres act as a sphincter. The bowel is not cut across. In the after-treatment, the patient is taught to get an action every morning by an enema, and the bowel will then stay quiet all day unless he gets diarrhoea from unsuitable feeding. The old-fashioned bag is pernicious, and causes prolapse by suction; a small close-fitting cap is all that is necessary, or even a simple wool dressing.

Closure of Artificial Anus.—The experience of most surgeons of the extra-peritoneal method of closing an artificial anus seems to be unsatisfactory. It is, however, ardently advocated by T. Carwardine,⁵ who learned it from Greig Smith himself. The stages are as follows: (1) The spur is reduced by a Dupuytren's enterotome. (2) A Banks rubber tube is inserted, with a stitch to anchor it; the purpose is to press down the spur, and straighten



Fig. 13.—Closure of artificial anus. The incisions. (By kind permission of the 'British Journal of Surgery')

out the bowel. (3) A button-valve is put in; it is made of two rubber discs, one placed inside the bowel, the other on the skin-surface; they are joined by

PLATE X

CLOSURE OF ARTIFICIAL ANUS

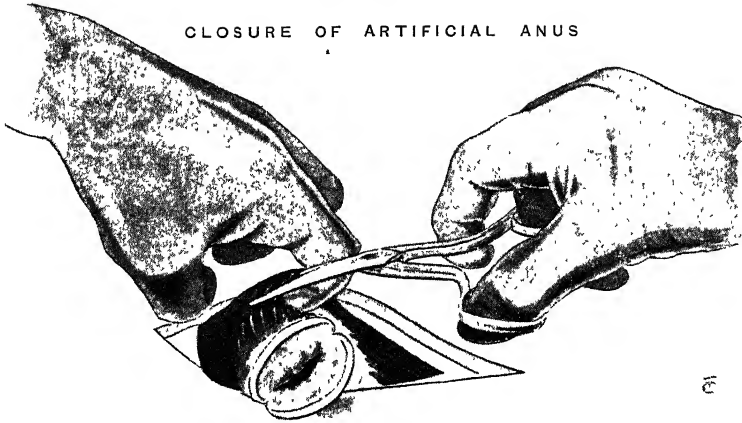


Fig. 1.—Deep separation of the bowel, showing the use of Groeg Smith's dissecting scissors and the protection of the peritoneum by the left forefinger.



Fig. 2.—Free mobilization of bowel. *a* Bowel lifted out of wound, showing free mobilization. *b* Bowel placed within the abdomen, anus extraperitoneal.

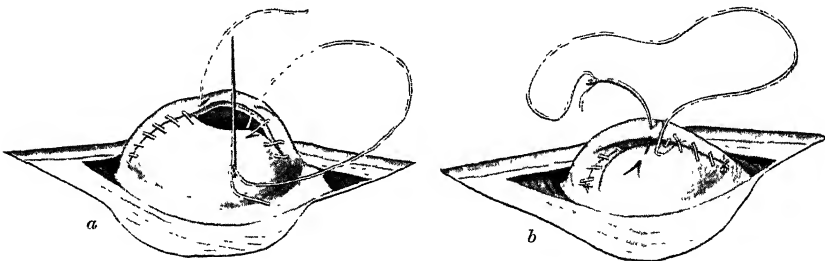


Fig. 3.—*a* Suturing edges of bowel, beginning at ends and tying in the middle. *b* Reinforcing suture, burying previous one.

By kind permission of the 'British Journal of Surgery'

a thread. (4) At the operation, the skin and muscles are cut away from the artificial anus, and the incision deepened down to the peritonæum. The peritonæum is then separated from the muscles all round over a circle of two inches radius or more, till the loop of bowel can be lifted freely out of the wound. (5) The actual opening is trimmed so that there is no tension, and then closed by continuous inverting stitches. A reinforcing layer is put in, and the wound closed with silver wire or silkworm gut, with a drain (*Fig. 13 and Plate X.*) Carwardine reports 38 cases, of whom 2 died, 2 were not successful, and 34 did well, though in two the operation had to be repeated.

Fixation Operation for Mobile Cæcum.—There is, of course, much difference of opinion as to whether it is worth while to do Waugh's operation, or something similar, for patients suffering from the chronic and rather vague symptoms of a dropped distended cæcum. Carslaw,⁶ of Edinburgh, reports on 242 cases treated by colopexy by Waugh's method. The results were summarized thus :—

RESULTS IN WAUGH'S METHOD OF COLOPEXY.

Sex and Age Incidence.

Ages ..	UNDER 10	10-19	20-29	30-39	40-49	50-59	60-69	TOTAL CASES
Female	1	10	63	57	33	11	1	185
Male ..	0	9	10	24	9	3	2	57
Total	1	28	73	81	42	14	3	242

Results.

Years since Operation ..	UNDER 1	1-2	2-3	3-4	4-5	5-6	6-7	TOTAL CASES	PER CENT
Cured ..	10	20	30	31	23	41	13	168	70.3
Very much improved.	5	6	13	5	6	5	4	44	18.4
Failures ..	0	5	5	5	4	3	5	27	11.3

McLennan spoke well of his results, but Sewell mentioned that in his hands 21 out of 69 were not improved, and only 32 were cured. It is the general experience that the earlier results of this operation are better than the later.

Several French surgeons contribute to a discussion on the same subject. Hertz⁷ uses cæcoplication (sewing the longitudinal muscular bands together so as to shorten the cæcum and reduce the lumen), and also colopexy. He reports 23 cases followed through: 14 satisfactory, 7 improved, 2 failures.

Elongation of the Pelvic Colon.—E. G. Slesinger⁸ believes that there is a condition of elongation of the pelvic colon associated with severe constipation and sometimes attacks of pyrexia. It may be diagnosed by the barium enema. In 5 cases, 2 children and 3 adults, he excised a length of the pelvic colon and performed an end-to-end anastomosis, and good results are claimed. One case had to have a subsequent operation for adhesions causing acute pain.

Cancer of the Colon.—Lockhart-Mummery⁹ discusses the surgical treatment. He dwells on the importance of careful pre-operative treatment in order to get the bowel clean and empty, which may take a week; Kerol and Bulgarian Lactic-acid Bacilli are useful. A diagonal incision is best. It affords good access, cuts no nerves, can easily be blocked by novocain, and is not followed by hernia. The patient is rolled over a little to allow the small intestines to fall away. Great care is taken to be sure that the cut ends of the bowel after

a resection are well supplied with blood, and a cuff of attached or free omentum is sewn over the union to prevent adhesions. A temporary cæcostomy is made to ease the pressure. The most difficult situation, of course, is when a growth low down in the pelvic colon has to be resected. The blood-supply of the upper part of the rectum is very apt to be interfered with. One may either do the complete abdomino-perineal operation, or sew a rubber tube into the proximal end of the colon and bring it down through the rectum to secure invagination, then fix with a few stitches, and make a temporary colostomy or cæcostomy. If the stump of the rectum will not bleed, this method is unsafe. [It is useful to insert a couple of stitches at the back, to unite the colon to the rectum behind the tube before the colon is drawn down and invaginated, and to tie them after this has been done. Otherwise it will probably be impossible to stitch behind the tube, and there may be leakage.—A. R. S.]

Fiolle,¹⁰ of Marseilles, discussing the method of resecting a cancer of the pelvic colon, objects to end-to-end anastomosis as dangerous, and to Paul's technique as involving another operation and a long convalescence. He therefore compromises, by only suturing three-quarters of the circumference, and leaving the remainder to discharge fæces through the wound. No tube is used, but the colon is sutured to the abdominal wall.

REFERENCES.—¹50 *Tag. d. deut. Ges. f. Chr.* Berlin, 1926; ²*Brit. Jour. Surg.* 1926, xiv, July, 58; ³*Presse méd.* 1927, Jan., 122; ⁴*Lancet*, 1927, i, 1079; ⁵*Brit. Jour. Surg.* 1926, xiv, Oct., 329; ⁶*Lancet*, 1927, i, 287; ⁷*Bull. et Mém. Soc. nat. de Chir.* 1927, June, 796; ⁸*Lancet*, 1926, ii, 274; ⁹*Brit. Med. Jour.* 1927, i, 950; ¹⁰*Marseille-méd.* 1926, Aug., 1286.

CONGENITAL DISLOCATION OF THE HIP. (*See HIP-JOINT, SURGERY OF.*)

CONGENITAL SYPHILIS. (*See SYPHILIS, CONGENITAL.*)

CONJUNCTIVA, DISEASES OF. *Lt.-Col. A. E. J. Lister, I.M.S. (retd.).*

Experimental Studies of Trachoma.—Under the title of "Chronic Granular Conjunctivitis induced in *Macacus rhesus* and Chimpanzee, by Inoculation of Cultures of a Micro-organism isolated from cases of Indian Trachoma," a paper of supreme interest to workers in the East was read by H. Noguchi¹ before the American Medical Association in May, 1927. Owing to the great importance of the subject it attracted much attention. The title above gives the gist of the matter. The organism is a bacillus, and was isolated from five cases of trachoma in American Indians, diagnosed by experts of the U.S. Indian Service. In all cases, scar tissue was present at the time of collection, and re-examination after one year showed that trachoma was still present. In microscopical characters the lesions in *Macacus rhesus* closely resemble those of human trachoma. The disease was also inoculated successfully into the eye of a chimpanzee from one of the infected rhesus monkeys. The bacillus has been occasionally demonstrated in sections and films derived from human and monkey materials. No details as to the bacillus are given in the paper, and the reviewer understands, from a very reliable American source, these have not yet been disclosed to the public. [Considering that millions of people suffer from trachoma in the British Empire alone, and hundreds of thousands probably are blind or partially disabled by it, this discovery, if it proves to be correct, is of the first magnitude, as it may point the way to better treatment and prophylaxis. Further details will be eagerly awaited by many workers on this important subject.—A. E. J. L.]

Spring Catarrh.—A good deal has been written lately on spring catarrh. A. G. Fort,² after a study of thirty cases, believes that it is due to hypersensitiveness to certain foreign proteins. Pollen skin tests were positive.

L. Lehrfeld³ studied the allergic skin reactions in five cases. Blood smears showed eosinophils. Protein extracts from strawberries, tomatoes, peas, corn, cat hair, dog hair, chicken feathers, June grass, orchard grass, red top, and timothy grass were used. All cases reacted to one or several of these proteins. In two cases there was a temporary improvement of the symptoms. Removal of the foods from the diet did not produce amelioration of symptoms. On the basis of the idea that vernal catarrh is a disease of individuals of vagotonic constitution, Baldassare obtained great improvement in three cases, following three to five injections of 0.25 mgrm. Adrenalin. A. Rizzo⁴ studied eleven cases with special reference to constitutional factors. Practically all the patients showed physical anomalies, including cunuchoid type, infantilism, and degenerative signs in secondary sexual characteristics. In four cases a status lymphaticus was demonstrable. Signs of vagotony, lymphocytosis, and other abnormalities were also present.

Neuropathic Conjunctivitis.—W. E. Shahan⁵ observed a case treated for five years for what was supposed to be neuropathic keratitis. The use of mercuriochrome accidentally revealed, by staining, a unique conjunctival condition which promptly responded to surgical removal of the area.

REFERENCES.—¹*Arch. of Ophthalmol.* 1927, Sept., 423; ^{2,3}*Ophthalmic Year Book.* 1926, 64; ⁴*Amer. Jour. Ophthalmol.* 1925, 461 (abstr. *Ophthalmic Year Book*, 1926, 668).

CONTRACTED PELVIS.

Beckwith Whitehouse, M.S., F.R.C.S.

The place of Induction of Premature Labour in the treatment of contracted pelvis formed a subject of discussion at the annual meeting of the British Medical Association in 1926. Bright Bannister,¹ in an opening paper based upon an analysis of 745 cases of contracted pelvis treated by induction at Queen Charlotte's and Charing Cross Hospitals, pointed out that the maternal mortality in the series was only 1.3 per thousand, a very low figure. The foetal mortality in the same series was 12.6 per cent. In 589 cases where delivery was unassisted the foetal mortality was only 8.5 per cent. Delivery by forceps of a premature infant is a procedure involving a high foetal mortality, 23.4 per cent of the babies having died before the end of the first month. In 24 cases induction failed, and either embryotomy or Cæsarean section had to be adopted.

This series of cases shows that premature induction of labour presents a very safe method so far as concerns the mother, and in favourable cases the foetal results also are good. Bannister confessed to a growing suspicion that Cæsarean section is being employed oftener than is justified in the presence of and in the anticipation of difficulty in labour due to pelvic deformity, a suspicion which is undoubtedly shared by other obstetricians. Induction of premature labour is an operation which can be employed with success in many cases where Cæsarean section is now done, and it should not be allowed to fall into a position of unjustifiable disrepute.

The choice of the best time for induction of labour is a serious responsibility and calls for repeated careful investigations by the practitioner in charge. Two main points have to be considered: the relative sizes of the presenting part and the pelvic brim, and the shape of the pelvis. In addition, but subsidiary to these, is the position of the child's head. A pelvis contracted in all directions presages an earlier induction than one in which flattening only is present. Pelvic obliquity, according to the writer, influences the date of induction. If the occiput be upon the contracted side the mechanical difficulties of delivery will be greatly increased, and induction should be carried out earlier than if the occiput lies on the wider side of the pelvis. Bannister strongly advocates examination under anæsthesia in all

cases where there is any doubt as to whether the head can be pushed through the pelvic brim.

When at the thirty-fifth week the head can be made under anaesthesia to engage fairly easily, induction is advised in fourteen days' time. On the other hand, if only a small amount of movement is obtained at the same period of pregnancy, one week's grace is allowed. Finally, if the head cannot be made to engage at all but there is no real overlapping of the symphysis pubis, the indication is immediate induction. A trial labour under these circumstances is employed in the most advantageous form and at a risk to the patient one-tenth as great as that involved in Cæsarean section.

The treatment of contracted pelvis is also the subject of a paper by Aleck Bourne² read before the Harveian Society of London. Bourne discusses the problem from the point of view of the case first seen during labour. After rupture of the membranes the points to be noted are fixity of the head, increasing flexion shown by the increasing prominence of the forehead, and descent. Increasing prominence of the forehead usually means that the head will pass the brim given strong contractions and sufficient time. Per vaginam, favourable signs are engagement of the head with the edge of the os and absence of much cervical œdema. Unfavourable vaginal signs are failure to reach the head and non-dilatation of the os, which, as the author says, 'hangs down as a loose fringe'.

In the case of the flat pelvis the practitioner is faced with three possibilities : (1) The head will not pass the brim ; (2) The head may or may not come through ; (3) The progress of fixity, flexion, and dilatation of the cervix shows that delivery is only a matter of time. In the first case, if the child is dead or moribund, perforation is the proper treatment. On the other hand, if the child is alive the alternatives are Cæsarean section, version, and craniotomy. The place of the former depends entirely upon the possibility of sepsis in a particular case. When the mother is exhausted and her tissues are bruised or lacerated, Cæsarean section cannot be too strongly condemned. Version, on the other hand, is in some cases of surprising value when sufficient relaxation of the uterus can be obtained by anaesthesia to eliminate the danger of rupture of the lower segment.

In cases of moderate contraction where time only is required to permit of sufficient moulding for the head to pass the brim, Bourne advocates an injection of *Morphia* $\frac{1}{2}$ gr. to $\frac{1}{4}$ gr. and *Scopolamine* $\frac{1}{150}$ gr. Scopolamine is repeated every one or two hours. The results are so good that the writer regards morphia and scopolamine as essential adjuncts to the treatment of the first stages of labour with a flat pelvis. Forceps must never be applied too early, and no amount of argument or excuses can justify the application of forceps to a high unmoulded head through a partially dilated cervix. Generally contracted pelvis presents a different clinical problem. Here the correct treatment is the application of forceps and steady traction after moulding is complete. This has not taken place until at least three hours after full dilatation of the os.

R. Brooke and F. Cook³ draw attention to a variety of *secondary pelvic contraction* produced by diminished mobility and ankylosis of the sacro-iliac joints subsequent to previous labours. The importance of the acquired deformity lies in the fact that it may be a cause of dystocia in a multipara in whom the previous confinements have been easy. When the head cannot be made to enter the brim in a multipara whose external pelvic measurements are normal, this cause of difficulty should be remembered.

REFERENCES.—¹*Brit. Med. Jour.* 1926, ii, 579; ²*Lancet*, 1926, ii, 1001; ³*Guy's Hosp. Rep.* 1926, Oct., 467.

CORNEA, DISEASES OF.*Lt.-Col. A. E. J. Lister, I.M.S. (retd.).*

Hypopyon Ulcer.—E. Stevenson¹ has had much experience of a severe type of corneal ulceration, chiefly due to injuries in ship repairing. In a mild case **Carbolic Acid** is used two or three days first. The author, after trial, has given up the actual cautery, as in his hands it did more harm than good. In severe cases **Chaufrage** is started at once; in the milder cases, if they do not yield to carbolic acid, in a couple of days or so. The small electric cautery handle and points, as listed by surgical instrument makers for eye cauterization, are used; the smaller the handle and points the better. The current is generated through the multostat. The eye is cocaineized, and, the operator standing behind the patient, who is seated in a low chair, the lids are held apart with the fingers of the left hand. The cautery point, varying in size according to the area which it is desired to treat, is brought to a moderate red heat, and the point is then gradually brought down to the surface of the ulcer until it is about $\frac{1}{2}$ in. away; it is then moved slowly backwards and forwards, up and down, over the surface for a few seconds, and the surface of the ulcer will begin to show signs of drying. The lids are then closed for a moment or two, and the heating is continued; this is done five or six times at a sitting. The application is repeated once or twice again in the day, if the ulcer is a bad one. **Vaseline** is always used afterwards, and **Atropine** if necessary. The procedure is so simple that it can be done by anyone with a steady hand, and the only thing to be guarded against is sudden closure of the lids if the patient feels any pain in the iris from the cautery point being too close to the cornea. In practice, the electric cautery is by far the best, but the ordinary platinum cautery and spirit lamp can be used, though this is a much more tedious method. The resulting scar is much thinner than if the ulcer heals under ordinary methods of treatment. The applications should be stopped as soon as the ulcer looks clean and the edge has ceased to show signs of spreading. **Chaufrage** is of no use in ulcers due to diplobacillary infection. **Zinc Sulphate** will cure such in a day or two. [Practitioners abroad are often called on to treat desperate cases of corneal ulceration. This method of treatment can be employed if needed, even in the wilds, by means of improvised apparatus. Some details have been given for this reason. There is a good deal of support for **chaufrage** of various kinds in the literature.—A. E. J. L.]

Treatment of Corneal Ulcer by a Double Flap.—K. Karelius² treated twenty-four cases of corneal ulcer by making two conjunctival flaps, the lower being anchored high up under the upper. The sutures were removed in five days, and by the tenth day retraction of the conjunctiva leaves the site of the ulcer covered by strongly vascularized tissue.

Herpetiform Lesions of the Cornea.—K. Mylius,³ after the instillation of **Holocaine** in two patients with herpetiform lesions of the cornea, observed a deep incrustation of the corneal tissue in areas in which the epithelium was absent. The incrustation could not be scraped off with a knife, and grated on being touched with the blade. After animal experimentation, the author arrives at the following conclusions: The alkali of the lachrymal fluid precipitates the free amidin base from the holocaine. The incrustation of the corneal tissue not covered by epithelium is caused by a reaction between the alkali of the tissue and the neutral holocaine. This reaction may be prevented by instilling a weak solution of an indifferent acid—for example, 0.5 per cent acetic acid—before employing the holocaine. [This last is an important point, as holocaine has been recommended for use as a substitute for cocaine in certain corneal conditions, on account of its antiseptic action. It also does not dilate the pupil, so is useful for the removal of foreign bodies. It was doubtless these properties that led the author to try it in the cases he mentions.

Further reports as to whether the same effects are produced in other corneal conditions in which there is a loss of epithelium would be useful. The reviewer, having had some experience of the use of acetic acid in other eye conditions, would hesitate before instilling it into a painful eye, as it is apt to cause pain in non-painful eyes. Yet a drug like holocaine, which has an anæsthetic effect on the cornea and at the same time is an antiseptic, has obvious advantages, in certain conditions, over cocaine, which damages the corneal epithelium.—A. E. J. L.]

Interstitial Keratitis in Congenital Syphilis.—W. H. Guy,⁴ writing of his experience in 160 cases in the period 1920–25, gives many details as to treatment. He is clear as to the value of general treatment by the newer methods. He says: “The improvement in the general condition while the patient was under routine treatment left little to be desired”. He stresses the point that treatment should be long continued: not just until the eyes are cleared. It should also be *intermittent*, to avoid the development of arsenic- and mercury-fast strains of spirochætes. Iodides should be used for their resolvent effect, because of the tendency to fibrosis in congenital syphilis and the gummatous nature of interstitial keratitis. The patient is to be treated as well as the infection, both local and general treatment receiving requisite attention.

Salvarsan in Interstitial Keratitis.—J. A. Downing⁵ says that, in a series of cases of this condition, the average time for cure where both salvarsan and mercury were used was six months; where mercury alone was used, fourteen months. [See MEDICAL ANNUAL, 1926 and 1927, for fuller information on this matter. There is no doubt that some authors have had a favourable experience with the arsenical compounds. Others say it is useless. There is little doubt that the method of use has some bearing on this matter, and that some cases do better than others.—A. E. J. L.]

Changes in Corneal Astigmatism with Age.—M. Monod⁶ says that of 150 children examined, 97 had direct astigmatism, 4 inverse astigmatism; 49 had no astigmatism. In 150 old people, 37 showed direct astigmatism, 57 inverse astigmatism. These figures, the author claims, appear to show clearly that corneal astigmatism changes in the course of life. [As it is certain that changes also take place in the refraction of the lens, this calls attention to the necessity for all persons of advancing age to have their refraction investigated—in the reviewer's opinion, at least every two years. Yet it is quite common for such people to go for ten years without having this done. This is by no means confined to the uneducated classes. See Jackson's remarks and the reviewer's note on the care of the eyes in the present volume (EYE AFFECTIONS, GENERAL), in this connection. There still exists in some quarters a remainder of the old rule-of-thumb rule, that an emmetropic presbyope requires a plus lens of one dioptré for each five years up to the age of sixty, and after that no change will be required. This is by no means true even in its main points, as often much less is required. Great comfort may be given to a person who has developed astigmatism, for instance, due to lenticular change, even at an advanced age. Knowledge is increasing in this respect, but the public need further education on this important matter.—A. E. J. L.]

Conical Cornea.—B. Alajmo⁷ concludes that patients with keratoconus are sympathicotonic individuals, and that this disease is due to a hormone dysfunction. [Conical cornea is sometimes a terrible disease in its results. It is well that attention should be called to the patient's general condition, as it may be possible to prevent the second eye from progressing, even if the first is seriously damaged. The reviewer has seen cases which bear out the author's contention

as to its etiology. He thinks he has seen benefit from treatment on these lines, but has not seen enough cases to be able to form a confident opinion.—A. E. J. L.]

REFERENCES.—¹*Trans. Ophthalmol. Soc. U.K.* 1926, 385; ²*Klin. Oczna*, 1924, ii, 8 (abstr. *Ophthalmic Year Book*, 1926, 78); ³*Zeits. f. Augenheilk.* 1925, lv, 133 (abstr. *Ophthalmic Year Book*, 1926, 16); ⁴*Jour. Amer. Med. Assoc.* 1926, Nov. 6, 1551, ⁵*Jour. Iowa State Med. Soc.* 1926, xv, 60 (abstr. *Ophthalmic Year Book*, 1926, 78); ⁶*Presse méd.* 1927, June, 710; ⁷*Arch. di Ottal.* 1924, xxxi, 547.

CORONARY ARTERY DISEASE. (See ANGINA PECTORIS AND CORONARY THROMBOSIS.)

CRAMP, MUSCULAR. Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

It has long been known that the phenomena of tetany and muscular cramp can be produced experimentally in normal individuals by the procedure of hyperventilation. This is induced by making the individual carry out continued forced breathing, paying special attention to expiration, for a period of two to eight minutes. The excessive elimination of CO₂ renders the blood excessively alkaline for the time. That such temporary alkalosis is one of the most important factors in the production of tetany and muscular cramps is shown by the fact that tetany arises in such varied but analogous conditions as over-dosing with alkalis, excessive loss of acid through a gastric fistula or by profuse vomiting or purging, the alkaline tide after meals, and the undue purification of the alveolar air by continued deep breathing. Alkalosis apparently acts on the nerve-cells and not on the muscle-fibres, since muscular contraction liberates lactic acid in the active muscle, a condition the reverse of alkalosis.

Acting on the alkalosis hypothesis of muscular cramp, G. W. Fitz¹ has made clinical observations in cases of idiopathic muscular cramps of various muscles, especially in cases following local muscular over-exertion. The simplest and most promising method of reducing the relative alkalosis of the blood and tissues concerned in the production of muscular cramp was, instead of eliminating CO₂ in excess, to try and prevent the escape of CO₂ from the alveolar blood by holding the breath and re-breathing the CO₂-laden air in a suitable collapsible bag, closely applied over the nose and mouth. The adoption of this procedure during attacks of muscular cramp, according to Fitz, checked the cramp within two to five minutes, not only without inducing headache or other toxic symptoms, but, on the contrary, favouring restful sleep after the attack. Moreover, in the two subjects most continuously studied, this treatment seems to have had a lasting beneficial effect, inasmuch as the attacks of cramp were reduced in frequency from one or two per week to once in several months. Other toxic causes, however, must not be neglected. Thus, for example, full doses of Salicylates relieve some cases of cramp; others are apparently cured by the removal of septic foci, such as those of diseased teeth, infected accessory sinuses, intestinal toxæmia, etc.

REFERENCE.—¹*Boston Med. and Surg. Jour.* 1926, Oct. 28, 854.

DEMENTIA PARALYTICA. (See also SYPHILIS OF THE CENTRAL NERVOUS SYSTEM.) Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

With regard to the incidence and pathogenesis of general paralysis, on going back to the early days of the spread of syphilis over Europe, one is struck by the absence of mental diseases resembling general paralysis in the first few centuries which followed. Assuming that the spread of syphilis in Europe dates back to the days of Columbus, it is significant that even as recently as the eighteenth century we have no records of mental diseases resembling general

paralysis. This disease apparently made its first appearance in the nineteenth century. There is considerable evidence that during this long 'incubation period' syphilis changed its clinical aspects in other respects as well. In 1910 the salvarsan era began, bringing with it what is usually regarded as a more general and efficient treatment of syphilis. Opinions differ as to the effect of this 'modern' treatment on the course of syphilis in general and on the subsequent incidence of neurosyphilis, including general paralysis. It is dangerous to argue from statistics; nevertheless it is fairly evident that recent years have not witnessed any increase in the proportion of general paralytics. The percentages of total admissions for general paralysis in the great hospitals of the world still varies between 10 and 20 per cent, and these same figures were given by Kraepelin in the year 1910. Some authors even claim an actual decrease in the numbers in recent years. The incubation period of general paralysis is variable, its average onset being about fifteen years from the time of the syphilitic infection. Certain factors are believed to shorten it, notably worry and fatigue. The early years of the Great War swelled the number of paralytics for a time; since then the incidence has again diminished, and there are no facts pointing to a prospective increase in the proportion of general paralytic patients.

How far treatment, absence of treatment, or inefficient treatment of the antecedent syphilis play a part in the production of general paralysis is a vital but still unsettled problem. It has sometimes been observed that general paralytics had previously suffered only mildly during the initial stage of their syphilitic infection, and that in particular they had often notably escaped marked secondary symptoms. From this it was argued that mildness of primary and secondary symptoms predisposed to general paralysis, and it was even inferred that it might be unwise to attack ordinary systemic syphilis too thoroughly, lest the case might thereby be converted into one with mild systemic symptoms and thus pave the way for subsequent general paralysis! Observations on the cerebrospinal fluid during the secondary stages of syphilis, even in the absence of central nervous symptoms, often yield positive reactions. There is no sufficient evidence, however, that this is a foundation on which general paralysis is necessarily laid, for it has been observed that there may be a long interval during which the spinal fluid becomes normal and yet general paralysis may subsequently develop. Moreover, few general paralytics are entirely devoid of signs of ordinary systemic syphilis, as witnessed by the frequency in them of syphilitic aortitis. Another theory is that too efficient treatment, e.g., by salvarsan, may sterilize the systemic circulation so effectively that insufficient antibodies are formed, so that the spirochaetes in the parenchyma of the nervous system, which salvarsan fails to reach, are not interfered with, thus leading to the production of general paralysis. Such a theory, however, is unconvincing. Salvarsan has now been in use for about sixteen years, and yet there is no apparent increase in the proportion of cases of general paralysis. Another important observation in this connection has been made. In England, out of 100,000 soldiers who were treated for syphilis during the Great War by salvarsan and whose eventual fate could be traced through the Ministry of Pensions, only ten were found to have developed tabes or general paralysis. It cannot therefore be maintained that salvarsan promotes the development of general paralysis.

There is no doubt that civilized races suffer more from general paralysis than uncivilized ones. To quote the old aphorism of Fournier, syphilization advances parallel with civilization. Several generations, however, suffering more or less from syphilis, seem to be required before the ground is sufficiently prepared for the production of general paralysis. This racial incubation-period seemed to

reach its development in the population of Western Europe somewhere about the year 1800. It is now approaching its completion among South African negroes, so that nowadays occasional cases of general paralysis are met with among pure natives. The North American negroes in this respect are more advanced than the South African, and many cases of general paralysis are now counted among them.

TRYPARSAMIDE TREATMENT.

M. Brown and A. R. Martin,¹ of the Gartloch Mental Hospital, record their experience of the treatment of 17 cases of general paralysis by means of **Tryparsamide** unaccompanied by any other medication. Their cases comprised patients in all stages of the disease, including three advanced and bedridden cases. In all of them the dose was 1 grm. weekly for six successive weeks, by intravenous or intramuscular injection. After the sixth injection one patient had severe congestive seizures and died within a few days. A second patient had meantime been transferred to another hospital. In the remaining 15 cases the weekly dose was increased to 2 grm. for eight successive weeks. Two more patients died after congestive attacks. Of the remaining 13 cases, only 2 failed to benefit. Speech, tremors, and gait all improved. Five have shown marked remission of mental and physical symptoms; 3 of them have been discharged on parole, and the other 2 transferred to home care. Three cases previously unemployable are now capable of work with some degree of initiative. Two bedridden cases are now able for light ward work. One parietic of four years' standing shows no mental improvement but is physically better. One case shows no change, and the single remaining case, a tabo-parietic patient with an alcoholic history, gradually became worse and died of bronchopneumonia two months after the course of treatment was completed. Examinations of the cerebrospinal fluid showed an improvement in the colloidal gold curve and in the Wassermann reaction in 59 per cent of these cases.

C. A. Neymann and D. E. Singleton,² who have treated 50 neurosyphilitic cases with tryparsamide, agree with other observers that advanced cases are not favourably influenced by the drug. About 50 per cent of their cases improved or recovered. It is usually necessary to give at least three courses before positive results can be attained. They consider that optic-nerve complications in properly controlled cases are not of serious import.

PYREXIAL TREATMENT.

A thoughtful critical review of the subject of modern pyrexial treatment of general paralysis has been published by A. Pijper and E. D. Russell,³ of the Pretoria Mental Hospital, from whose paper the following paragraphs are abstracted.

An important preliminary point concerns the prognosis of untreated general paralysis. In other words, is general paralysis, as it occurs in our time, really so rapidly fatal, and is the occurrence of spontaneous remissions really so negligible, as we used to believe? Another point is that pyrexial treatment is not devoid of danger, in more than one respect. The problem is whether the advantages of pyrexial treatment outweigh its disadvantages. It must must also be admitted that the pyrexial treatment is wholly empirical, and lacks scientific foundation, at least as to its precise mode of action.

The history of pyrexial treatment is interesting. For many years clinicians have noted that fever of various origins has had a beneficial effect on the course of general paralysis and on other forms of mental disease. Schultze⁴ mentions that Koster, so long ago as 1848, wrote a dissertation on the favourable

effect of **Malaria** on insanity, and the transfer of mental hospitals to malaria-infested regions was a subject of discussion amongst the alienists of the day. Jacobi in 1854, and H. Meyer in 1877, purposely created fever in their general paralytic cases by means of artificial abscesses. Tuberculin was the next thing to be tried, and subsequently typhoid vaccine. Both of these improvements in technique were due to Wagner von Jauregg,³ of Vienna, who in 1917 inaugurated the present era of pyrexial treatment by introducing artificial inoculation with malaria. Whether malarial treatment is the most efficient, or simply the most convenient form of pyrexial treatment, is still a debatable point. It has become the most popular form at the present time, but other varieties of pyrexial treatment are also available, e.g., by means of **Vaccines** (streptococcal, staphylococcal, pyocyaneus, typhoid, proteus, etc.), and chemical preparations such as **Sodium Nucleinate**, **Hetol**, and various **Proteins**, including

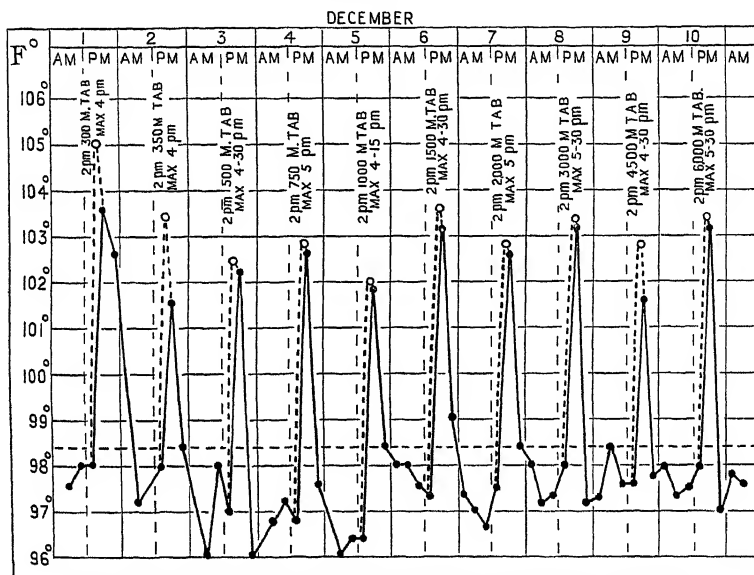


Fig. 14.—Pyrexia induced by intravenous protein therapy in general paralysis.
(By kind permission of the 'Lancet')

milk, still find their advocates. Plaut started using **Relapsing Fever** shortly after Wagner von Jauregg began employing malaria.

In considering the different treatments of general paralysis it must be remembered that nowadays the prognosis cannot be regarded as absolutely hopeless. Spontaneous remissions occur, and have been put as high as 24 per cent in the expansive and excited type of the disease. One has therefore to be on one's guard against the *post hoc* and *propter hoc* fallacy, in those cases in which remissions have followed ordinary salvarsan treatment.

There is a general consensus of opinions amongst clinicians that in general paralysis, mercury, salvarsan, and other drugs, administered by ordinary routes, are inefficacious. Efforts to bring the salvarsan where it is wanted, i.e., into the parenchyma of the central nervous system (which salvarsan seems unable to reach when injected into the blood-stream) have led to the employment of various other methods, e.g., by intrathecal or intracisternal injection. These

require a degree of technical dexterity, but seem to have a considerable degree of usefulness, especially in the form of after-treatment.

To what extent Sagel and Reiter's⁶ attempts to influence the course of general paralysis by means of vaccination with live cultures of *Spirochæta pallida*, for which their new cultural methods are so particularly suitable, will justify themselves, remains to be seen. So far they are in the experimental stage, but from certain points of view they are eminently rational.

Coming now to the *various forms of pyrexial treatment*, injections of various dead materials have been tried. Tuberculin, sodium nucleinate, milk, and various vaccines have all been tried. Recently J. M. Mackenzie,⁷ of Rubery Hill Mental Hospital, has carried out a series of observations on 13 patients, using a stock T.A.B. Vaccine, by daily intravenous injections, increasing in dosage from 300 million up to 6000 million. This was followed by four weekly injections of 45 cgrm. of neosalvarsan. Then came a second series of T.A.B. vaccine, increasing from 1500 million up to 25,000 million, followed in turn by a similar series of neosalvarsan injections. As a result of the vaccine course, marked pyrexial reactions were obtained as shown on the accompanying chart (*Fig. 14*), frequently accompanied by rigors, vomiting, and diarrhœa, but no permanent ill-effects were noted, in spite of the massive doses used. The most striking clinical result of the vaccine injections was in cases of excited general paralysis: the extreme motor restlessness was quickly controlled, and did not return when the pyrexial treatment was suspended. In several cases focal reactions were noted, especially in one man who developed apical abscesses around infected teeth and who remained restless and violent until these were extracted. Clinically most of the cases benefited, but no constant changes were observed in the serological reactions. The advantages of this particular method of inducing pyrexia are that a suitable high pyrexia can be readily induced, similar to that resulting from malaria, but without introducing a living organism and without the difficulties and disadvantages of mosquito transportation and protection; the material is standardized and easily obtained; there is no incubation period, and in all cases the rigor occurred within half to one hour after injection, whilst in the event of any untoward symptom the injections can be discontinued. The disadvantages are the possibility of inaccessible or difficult veins, or the occurrence of venous thrombosis after injection, also the expense of the vaccine in higher dosages.

Passing now to the *microbic methods* of inducing pyrexial treatment, the three chief varieties of living microbes at our disposal are: (1) *Malaria*; (2) *Relapsing fever*; and (3) *Rat-bite fever*.

1. *Malaria*, for the moment, is the most commonly employed of the three. Malarial therapy has now been carried out continuously for over three years in nearly all the mental hospitals of the London County service.⁸ A preliminary official report has been issued from which we learn that 191 cases have been treated by a course of eight or more febrile paroxysms and that no case has been included in this list which has not been watched subsequently for a period of at least six months. According to these statistics, malarial therapy produces a greater number of remissions (33.5 per cent as compared with 2.6 per cent) and a smaller death-rate (20.9 per cent as compared with 62.1 per cent) than occurs in untreated cases. Complete remissions occur in about one-third of the cases in a mixed series, but in a much greater proportion if early cases with histories of dementia paralytica of less than eighteen months' duration are taken. The addition of intravenous *Salvarsan* to the febrile treatment decreases the death-rate amongst the cases unfit for discharge and perhaps increases the number of complete remissions that occur. All the medical officers are agreed that in a majority of cases treated by malarial therapy which proved unfit for

discharge, a marked improvement was observed in general well-being, cleanliness, and conduct.

Malarial strains, when inoculated from patient to patient, more or less rapidly lose the capacity of producing gametes, and thus of infecting mosquitoes. In several cases this has been demonstrated experimentally by allowing mosquitoes to bite inoculated malaria patients; such mosquitoes, when placed on healthy persons, sometimes failed to convey malaria. Nevertheless it is advisable to keep inoculated patients behind mosquito screens. A benign tertian strain of malaria should always be secured. Once a patient has been inoculated, his blood can be taken at any time for handing on the inoculation, provided the donor has not had quinine. The malarial blood can be injected subcutaneously or intravenously. The latter method shortens the incubation period to four or five days, or even less. It is advisable to use doses of at least 2 c.c. of blood, to avoid disappointment, although the incubation period is independent of the dose given. The simplest method is to take the blood from one patient into an oiled syringe and to reinject it immediately into a vein of the next patient. Mosquitoes can be used with patients at a distance, and teams of infected mosquitoes are available in London for biting patients, but this method is sometimes a little difficult to arrange conveniently.

The inoculated malaria is allowed to run its course until the patient has had seven or eight successive rigors, carefully watching the heart. Some physicians allow as many as twelve or even sixteen rigors. In cases where the fever comes to an end too rapidly, it is sometimes possible to produce a few more rigors by injecting $\frac{1}{2}$ to 1 c.c. of adrenalin chloride 1-1000. The malarial infection is easily cut short by moderate doses of quinine, 7½ gr. twice a day, for a week, or by neosalvarsan in a single dose of 60 cgrm., followed by a second similar amount after a week. Most physicians follow up the malarial course by a series of salvarsan injections, and Purves-Stewart⁹ further supplements this by weekly or fortnightly intracisternal injections of salvarsanized serum, carefully noting the reactions of the fluid at each injection. The first element in the cerebrospinal fluid which improves under this treatment is the pleocytosis. Later the globulin reaction becomes less, then the Wassermann reaction begins to diminish, whilst the colloidal gold curve is the last to fall to normal. When malarial treatment alone is employed, without supplementary use of salvarsan or salvarsanized serum, the clinical improvement may be unaccompanied by corresponding changes in the serological picture. So long as this is the case, it is obvious that the patient's condition cannot be regarded as anything like secure.

J. R. Driver, J. A. Gammel, and L. J. Karnosh,¹⁰ of Cleveland, employed malarial treatment in a series of 79 cases of neurosyphilis. In 6 cases the inoculation failed, and in 8 others treatment was interrupted for various reasons, leaving a total of 65 cases on which to base their conclusions. Out of their 31 unselected cases of general paralysis, 8 obtained remissions sufficient to allow them to return to work, 8 more were moderately improved, 4 were slightly improved, 7 were uninfluenced, and 4 died. Similar results were observed in 13 cases of tabo-paralysis. Two cases of juvenile general paralysis were uninfluenced. The effect on 12 cases of tabes was most encouraging. There was complete disappearance of persistent gastric crises and lightning pains in 3 patients, whilst 6 others showed a definite decrease in the severity and frequency of their pains. The objective signs of tabes remained uninfluenced, so also did the serological reactions. In 7 cases of meningovascular syphilis, 2 showed a moderate improvement in general physical condition, but here again the serological reactions were practically uninfluenced.

P. A. O'Leary, W. H. Goekerman, and S. T. Parker,¹¹ of Rochester, Minn.,

have followed up 35 cases of general paralysis for two years, and 65 additional cases for one year, after malarial inoculation. There was a mortality of 8 per cent, of which they attribute 5 directly or indirectly to the malaria. Whilst convinced as to the value of the method, their views have become modified by experience since their first series of cases. They now recommend following up the malarial treatment by various antisyphilitic measures, especially by intrathecal administration of salvarsanized serum, combined with intramuscular injections of bismuth.

2. Relapsing Fever.—Treatment by inoculation with the *Spirochaeta duttoni* was originally introduced by Plaut and Steiner¹² in 1919, with the idea that better results might be obtainable by the use of a spirochæte than by the malarial plasmodium, which is biologically unrelated to the syphilitic spirochæte. There was also the fact that both relapsing fever and syphilis are specially vulnerable to the salvarsan group of drugs. L. Horn,¹³ of Vienna, has compared two series of general paralytics, 33 in each group, one group being treated by malaria, the other by relapsing fever. The inoculation of this latter was from man to man in 29 cases; in the remaining 4 it was from mouse to man. In both series of cases subsequent treatment by neosalvarsan was also carried out. Complete remissions were obtained in 14 cases after malaria and in 6 after relapsing fever; incomplete remissions were practically the same in both series, 10 cases after malaria and 9 after relapsing fever; 6 were uninfluenced by malaria and 15 by relapsing fever, whilst 3 patients in each series died. They noted that improvement after relapsing fever was slower in onset than after malaria, and they suggest that this may be due to the slowness with which the *Spirochaeta duttoni* is removed from the brain by the salvarsan. They also noted a frequent transient rise in the cell-content and albumin-content of the cerebrospinal fluid immediately after inoculation with relapsing fever, in contrast with the tendency for reduction of both these elements after malarial inoculation. On the whole, therefore, the results of relapsing fever are fairly comparable with those of malarial treatment, with the convenience that the infection can be kept alive in mice instead of depending on human subjects for our supply.

3. Ratbite Fever.—A third variety is by means of sokodu or ratbite fever, produced by inoculation with *Spirochæta morsus-muris*. Sodoku is a fairly common disease in Japan, and has been occasionally recognized in the United States and in Europe. Infection is produced by the bite of a rat or other infected animal. At the site of the rat-bite, after an incubation of five to ten days, a local sore, suggestive of a chancre, is produced. The neighbouring lymph glands become enlarged, spirochaetosis spreads to the blood-stream, and after five to fifteen days from the primary sore, fever occurs, with skin eruptions, not unlike those of secondary syphilis, especially on the trunk. The fever is of intermittent type, rising to 104° or 105.5°, lasting for four or five hours and recurring at intervals of one or two days. The disease lasts for months, but is quickly cut short by salvarsan. The spirochæte can readily be maintained indefinitely in laboratory animals such as mice and guinea-pigs. H. C. Solomon, A. Berk, M. Theiler, and C. L. Clay,¹⁴ of Boston, treated a series of 12 cases of general paralysis by means of sokodu inoculations and have published a preliminary report. Intravenous inoculations, from animal to man, are preferable to intradermal inoculations, because they avoid the formation of a primary lesion and of the subsequent lymphangitis which follow successful intradermal inoculation. The artificially produced disease is similar in its clinical manifestations to the naturally acquired disease, and is readily controlled by salvarsan. As a therapeutic method they claim that its theoretical possibilities are equal to those of malaria. In addition it has several practical advantages. The

organisms can be maintained in laboratory animals and is thus always available for use. This obviates the necessity of transmitting human blood or having on hand a case of human infection. The disease is less debilitating to the patient than malaria. Moreover, it can be given to patients who are more or less immune to malaria. It is also available as an addition to the malarial therapy, and may be given either before or after malaria, without modifying the clinical course of either condition.

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DENGUE.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

An outbreak of seven-day dengue in Lucknow is described by H. Stott¹ and is illustrated by temperature charts. The cases presented the typical features of that disease as described in Calcutta twenty years ago. Three-day attacks were rare; sand-flies were scarce, but mosquitoes prevalent. G. H. Dye² describes a very similar outbreak in Aden as shown by an analysis of 100 cases. Enlargement of the cervical lymphatic glands was a common feature and useful in the diagnosis. Urines were examined for leptospira with negative results.

The mortality in dengue epidemics in Australia is discussed by F. McCullum and J. P. Dwyer³ in light of the vital statistics, and they agree with the general opinion that it is very low, but not negligible, considering the widespread nature of the outbreaks. He found the estimated case mortality-rate from the disease was 0.03 per cent, and that in some places as many as 70 to 80 per cent of the population had been attacked, and that most of the deaths occurred at under one year of age and over 80 years. Hyperpyrexia was the greatest danger apart from complications.

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DERMATITIS OF THE DIAPER REGION IN INFANTS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

J. V. Cooke¹ has made a study of the affection commonly known as 'Jacquet's dermatitis', which is characterized by the appearance of pea-sized papules with vesicles and later erosions on the prominences of the buttocks, scrotum, and thighs, even involving the calves of the legs and heels where they come in contact with the diaper. The condition is fairly frequent, and is sometimes mistaken for the condylomata of congenital syphilis. Cooke attributes these lesions to the presence of ammonia in the diaper. The fæces of many infants contain a non-pathogenic, non-motile Gram-positive bacillus which is capable of forming ammonia from urea, a property which other intestinal bacteria do not possess. The bacillus is constantly present in the faecal discharges of those infants whose diapers have an ammoniacal odour. The treatment recommended consists in inhibiting the growth of bacteria by the use of an **Antiseptic Diaper**. He advises that the diaper, after washing, should be soaked in a solution of 1-4000 perchloride of mercury, then wrung out and allowed to dry.

[It may be pointed out in this connection that reference was made in last year's *MEDICAL ANNUAL* (p. 453) to the probability that many of these cases of Jacquet's dermatitis were due to yeast infections. The author of the paper referred to above does not appear to have investigated this point, nor are

the arguments for his ammonia theory by any means conclusive. The treatment he recommends would be equally successful in cases of yeast infection. —A. M. H. G.]

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1926, Nov., 539.

DERMATITIS DUE TO X RAYS. (See RADIODERMATITIS.)

DIABETES.

Hugh MacLean, M.D., D.Sc., F.R.C.P.

The present position of diabetes and its treatment by insulin was fully discussed in July, 1927, at the meeting of the British Medical Association in Edinburgh.¹ The general opinion expressed was that, on the whole, **Insulin** may be relied upon to control the symptoms of diabetes in uncomplicated cases. There are certain obvious drawbacks to its use, but when judiciously administered it usually results in restoring the otherwise normal patient to a satisfactory state of health. This is especially so when insulin is used at an early stage of diabetes. According to MacLean,¹ insulin should, if possible, not be given more than twice daily. Though it may be impossible to control the glycosuria entirely by two injections, yet the injurious mental effects of several injections per diem are often so marked that the practice may do more harm than good. With regard to Diet, experience shows that, provided sufficient insulin is taken, there are fairly wide limits between which the patient can live and thrive. Many of our accepted ideas with regard to diet are theoretical and do not always work out well in actual practice. It is, for instance, quite unnecessary for the average patient to weigh his food provided he is taking sufficient insulin. Patients who are feeling fit as the result of insulin treatment are usually engaged in some business and cannot be expected to carry a balance about with them. All that is required is to teach the patient during the earlier days of treatment how much food is represented by a definite weight. After a little practice he is able to select and gauge his diet with ease. The average patient very soon learns to eat approximately the same amount of food each day without weighing it. The added comfort induced by this method results in the patient being in better general condition than is the case when his food is scrupulously weighed out for him. The simpler we make all the arrangements connected with insulin therapy the better results we obtain, provided that the main principles are always kept in view.

Insulin Œdema.—Rabinowitch² draws attention to the tendency of insulin to produce an œdema of the body tissues of the diabetic, and asserts that this largely accounts in a great number of cases for the rapid increase of body weight frequently noted after the administration of insulin. He describes a case of a diabetic patient who after being put on insulin gained fifteen pounds during a period of eight days. At this point there was slight puffiness of the face and some œdema of the legs. Insulin was discontinued and a polyuria followed; five days later this patient had lost eleven and a half pounds. Following renewed insulin administration the polyuria disappeared, and he again began to gain weight. Another patient showed somewhat similar effects with œdema of the legs and some puffiness of the face. Rabinowitch states that salt retention could not possibly have been the only cause of the œdema, and renal inefficiency was ruled out, as all the ordinary kidney tests gave satisfactory results. The possibility is suggested that in these cases of œdema following the use of insulin we are dealing with some colloidal phenomenon, and that insulin increases the hydration capacity of the tissue colloids of the body. An attempt was made to correlate the intensity of the œdema with the severity of the diabetes, but the only definite observation made was to the effect that these patients were receiving comparatively large doses of insulin. The phenomenon occurred

in patients having 40 units of insulin and upwards per diem, and was not present when the daily dose of insulin was 10 units or less. These observations suggest that this type of œdema is more likely a result of the dose of insulin than of the severity of the diabetes. It may be that insulin œdema may at times prove harmful in view of Joslin's suggestion that it may be a factor in the production of the anuria which develops during coma, for the latter observer found some relationship between insulin dosage and anuria.

Hyperinsulinism.—This term was first employed by Harris in 1924 when he described not only the symptoms produced by excessive dosage of insulin in diabetics but also other forms of hypoglycæmia found in non-diabetic patients. The chief symptoms of this condition were a marked degree of hunger before meals, associated with a fasting hypoglycæmia. In an interesting publication H. J. John³ employs this term to indicate a group of symptoms which may follow prolonged over-dosage with insulin. The chief of these symptoms are so similar to those of hyperthyroidism that it may be difficult to make a differential diagnosis between these conditions on the basis of the symptoms alone. Consequently hyperinsulinism should always be ruled out by blood-sugar examination if hyperthyroidism is suspected in a patient who is being treated with insulin. The treatment of hyperinsulinism is simply to discontinue the insulin, and if this be insufficient, then administration of some food between meals will prove effective. Voracious hunger a few hours after the administration of insulin usually indicates hypoglycæmia. Urinary examination alone is not a sufficient basis for judgement in a case of diabetes in which insulin is employed. If in such a case the patient happens to have a low renal threshold he may continue to eliminate sugar even in the presence of hypoglycæmia. Without a glucose tolerance test such a condition might be interpreted as due to insufficient insulin dosage, and the insulin treatment would be continued and the dosage might even be increased, a course which would inevitably lead to hyperinsulinism.

R. M. Wilder⁴ emphasizes the fact that the *association of diabetes and hyperthyroidism* occurs with a frequency of about 1.1 per cent of all cases of hyperthyroidism. Exophthalmic goitre is less frequently complicated by diabetes (0.6 per cent of all cases) than is adenomatous goitre with hyperthyroidism (2 per cent). The symptoms of hyperthyroidism in a patient with diabetes may be obscured by those of the diabetes, and this is particularly true in cases with severe acidosis or diabetic coma. A mild and possibly inconspicuous diabetes may be fanned into flame by hyperthyroidism, and severe hyperthyroidism will readily provoke coma in a diabetic subject. The amount of insulin required is increased by hyperthyroidism. Iodine administered as compound solution in a dosage of from 20 to 60 min. daily to patients suffering from combined exophthalmic goitre and diabetes reduces the intensity of the diabetes. This effect parallels that of the basal metabolic rate. Iodine has little or no influence on the course of diabetes associated with adenomatous goitre with hyperthyroidism, and is without effect in cases of uncomplicated diabetes. Thyroidectomy is almost always followed by a considerable gain in tolerance in diabetes complicated by hyperthyroidism. Sometimes this is so great as to suggest an actual cure of the diabetes, but a sugar tolerance test may still reveal the persistence of the diabetic tendency. Cure may also be simulated when a hypothyroid state is induced by the operation. A case of juvenile diabetes is cited to illustrate the palliative effect of myxœdema developing in diabetes. When the basal metabolic rate of this child was restored to normal the previous diabetic state returned.

During the year a considerable number of papers chiefly dealing with the use of insulin have appeared, but there is really little new to record. Year after

year repetition of facts already well known continues to swell the literature of this subject, but it is now rare to find an original observation. Much, however, has been written towards the end of 1927 on a new drug called *synthalin* for use in diabetes.

Synthalin.—As long ago as 1918 Watanabe⁵ published several papers dealing with the effect of guanidine on metabolism, and showed that this product possessed marked effects in lowering blood-sugar. E. Frank⁶ and his colleagues, working in Minkowski's clinic at Breslau, repeated Watanabe's experiments, and, finding that his observations were correct, carried the investigation further. They found that guanidine itself was too toxic to be used therapeutically, so they tested a number of guanidine derivatives in an attempt to find one possessing hypoglycæmic properties without producing toxic symptoms. Their first experiments were carried out with a substance called agmatine isolated by Kossel from herring roe in 1910. This substance has the formula $\text{NH}_2\cdot\text{C}(:\text{NH})\cdot\text{NH}\cdot\text{CH}_2\cdot\text{CH}_2\cdot\text{CH}_2\cdot\text{CH}_2\cdot\text{NH}_2$, and has later been isolated from ergot. It was found to possess an insulin-like action but had certain drawbacks. Frank and his colleagues then began a series of experiments to test the effect on the blood-sugar of alkyl derivatives with a longer CH_2 chain. These were found to possess a serially increasing effect, and one of them, which they have named *synthalin*, proved sufficiently satisfactory to allow of it being tested clinically.

The claims made by Frank on behalf of *synthalin* are that it has an action similar to that of insulin and that it can be administered by the mouth. The most serious difficulty in the use of insulin is the necessity for hypodermic injection, and this is especially marked in the case of children. It would be a most notable advance if some substance could be found that would act, when administered by mouth, as insulin does when injected. It is well known that insulin when given by mouth is inactive, but *synthalin* acts almost equally well when given orally as it does when given by injection, the dose required by mouth being only about one and a half times that necessary by injection. The average dose of *synthalin* varies from about 40 to 50 mgrm. daily. That this substance has a definite action on carbohydrate metabolism there can be no doubt. It does not seem to be as powerful as insulin in its action and is much slower in producing its results, but the effect is cumulative. Frank also claims that *synthalin* is efficacious in certain cases of diabetes which do not respond well to insulin; he further recommends its use in mild cases, and in more severe cases along with insulin.

Experiments with *synthalin* have been carried out in this country, but on the whole the results were somewhat disappointing. That this substance lowers the blood-sugar and reduces the amount of ketone bodies in the urine, in some patients at any rate, is quite certain, but its effects in this direction do not appear to be very marked. The chief objection to its use is its toxic properties. In many patients it sets up gastro-intestinal disturbances which may be comparatively severe; along with this the patients often complain of an indefinite feeling of 'malaise'. Further, there is some reason to believe that the drug may have a deleterious influence on the liver, and especially on the kidneys, for albuminuria occasionally follows its use. In some patients these toxic effects are quite severe. The writer has seen one diabetic patient whose condition became serious after taking *synthalin*. This patient was being treated by insulin and was sugar-free and practically ketone-free. An attempt was made to reduce the insulin dose and to substitute part of the insulin by *synthalin*, with the result that the patient became very ill and showed symptoms of threatening coma. On stopping the *synthalin*, much larger doses of insulin than formerly were necessary, and it required several weeks for the

patient to regain his normal strength. In some subjects, however, synthalin can be tolerated without any ill-effects, and when this is the case there is no objection to its use. Sometimes, in patients taking very large doses of insulin, the dose may be reduced by adding some synthalin.

On the whole, the present position of synthalin is that its toxic action is too great for safety in clinical use. Moreover, its activity is not very marked, and so far it has failed to supplant insulin, though in the case of patients who can tolerate the drug its use along with insulin might be helpful. In the hands of the writer, synthalin proved altogether too toxic for use in the majority of the cases tried, though in one or two it was taken quite well and proved useful to some extent. For literature on the subject of synthalin see Blum and Carlier,⁷ Jansen and Baur,⁸ Mosler and Feureisen,⁹ Hirsch-Mammoth and Perlmann,¹⁰ Formiguera,¹¹ Frank and Heyn,¹² Morawitz,¹³ Wolf,¹⁴ Chabanier and Lebert,¹⁵ and some articles in the *Lancet*.

Senile Glycosuria and Diabetes.—A considerable amount of discussion takes place from time to time as to whether glycosuria as so often seen in the elderly is really ordinary diabetes or not. That this glycosuria usually runs a different course and presents an entirely different clinical picture from ordinary diabetes as we know it in the young is the experience of all medical men. Whether or not this glycosuria is essentially of the same nature as diabetes is quite undecided, but there is a good deal of evidence that there is some difference between the two types. At present we do not know the mechanism involved in the metabolism of carbohydrate in the normal person, and, until we do, no definite answer to the question can be forthcoming. The opinion of Graham¹ and Lawrence¹ is that the two conditions are essentially the same, while MacLean¹ inclines to the view that there is some unproved but essential difference between these types. Clinically the difference has been observed constantly; the outlook in glycosuria is entirely different from that in ordinary diabetes, and whatever the cause of this glycosuria it is helpful to the medical man to recognize that its significance is not the same as that of true diabetes. In very many cases of glycosuria no insulin is required, while in practically all cases of ordinary diabetes it is necessary sooner or later. As long as the essential clinical difference between these two types is recognized by the medical man, any discussion as to whether they are different entities is of academic interest only.

Gastric Changes in Diabetes and Glycosuria.—E. MacPherson¹⁶ carried out an analysis of the gastric contents in 10 cases of diabetes and found complete absence of hydrochloric acid in 4 of the most severe. In some of these patients the administration of dilute hydrochloric acid by mouth was found of practical value when combined with insulin. In 4 cases hyperchlorhydria was present. In forms of glycosuria in which the blood-sugar was not persistently high, no changes were found in the gastric secretion. It is suggested by this observer that when a case of hyperchlorhydria undergoes apparently spontaneous cure this may be an indication of commencing failure in carbohydrate metabolism.

Earliest Symptoms in Diabetes.—Diabetes may be a very insidious disease, and the first symptoms noticed may not be the same in different patients. Escudero and Bosch¹⁷ give a table showing the first symptoms noted in 224 cases of diabetes. These symptoms occurred in the following order: Frequency and thirst, 59; loss of weight, 47; pruritus, 25; 'rheumatic' pains, 16; pyorrhœa, 17; asthenia, 14; boils or other skin lesions, 9; hunger sensations, 8; repeated abortions, 8; impotence, 5; cataract, 5; miscellaneous, 13. In 260 out of a total of 825 patients there was a diabetic history in parents or other relatives. The hereditary taint could often be traced backwards, and a diabetic child sometimes led to the discovery of an unsuspected pre-diabetic

condition in the parent. Among predisposing infections, syphilis and oral sepsis were found to be the most important. There was hypertension in 70 per cent, and obesity in 30 per cent. Itching was sometimes found to be the only sign of latent diabetes.

The Pancreas in Diabetes.—S. Warren,¹⁸ in a very suggestive publication, refers to the fact that, in 10 cases of fatal diabetes occurring in children and young people, careful examination of the pancreas failed to reveal any startling pathological changes. In a few cases the pancreas was said to be small, but the amount of islet tissue was not sufficiently reduced to account for the disturbed metabolism in most cases. In the young there is little pathological change either in the islets or acinous tissue, though such changes are commonly reported in the old, and that present does not appear to be sufficient to explain the marked disturbance in function.

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DIPHTHERIA. (See also SERUM DISEASE.)

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—The fourth annual summary by the *Journal of the American Medical Association*¹ of diphtheria mortality in the 78 cities of the United States with a population of more than 100,000 shows that the total deaths from diphtheria were approximately 3000 in a population of 31,000,000, or more than three times the typhoid mortality in the same cities. A substantial fall in the urban diphtheria rate has occurred since 1923, viz., from 13.12 to 9.48; but the absolute and relative drop in 1926 was less than in preceding years, chiefly owing to the prevalence of a virulent type of diphtheria in a number of cities. Virulent epidemics of diphtheria have also been reported in Paris by P. Lereboullet,² and in Berlin by H. Deicher and F. Agulnik.³ Lereboullet states that during the second half of 1926 the recovery-rate among laryngeal cases was only 68 per cent, and among severe faucial cases 62 per cent, or a total mortality of 13.2 per cent, whereas during the first six months of the year, out of a total of 400 cases of diphtheria admitted to the Hôpital des Enfants Malades, the recovery-rate was 84 per cent among the laryngeal cases and 81 per cent among those of severe faucial involvement, the total mortality from diphtheria being under 5 per cent. The chief cause for the rise in mortality was the relative frequency of associated and secondary infections such as measles or streptococcal or pneumococcal infections. In comparatively few cases was the severity of an early and virulent diphtherial infection alone responsible, as was chiefly the case in the Berlin outbreak.

W. Fletcher⁴ states that diphtheria was a very rare disease in the Malay States before 1916, and though it is much commoner now, there have been no serious outbreaks such as might have been expected to follow the introduction of a new disease into a susceptible community. Schick tests show that the population is highly immune to diphtheria, the population of susceptible children in the schools of Kuala Lumpur being about the same as in those of New York. As in America and elsewhere, the children of wealthier parents are more susceptible than those of the poor. The immunity of the population is probably due to the large number of immigrants from China, India, and Ceylon who have been streaming into the country for years and must have repeatedly introduced the diphtheria bacillus. The recent increase in

diphtheria is probably due to the large number of female immigrants and subsequent increase of the child population.

BACTERIOLOGY AND PATHOLOGY.—E. Martner⁵ studied the bacteraemia in diphtheria in 40 cases before injection of antitoxin. Ten c.c. of blood were withdrawn from the elbow vein, or in young children from the jugular vein, and immediately put in a culture medium of 1 per cent glucose broth. The flasks were incubated for at least twelve hours, and if sterile were re-incubated and examined at the end of 24, 48, and 72 hours. In cultures which gave a growth, subcultures were made on Löffler's blood serum and agar plates. Cultures were obtained in 6 of the 40 cases, viz., pure cultures of *Corynebacterium diphtheriae* in 3, and hæmolytic streptococcus in 3. The former were obtained from cases of hæmorrhagic diphtheria, and the latter from cases of septic diphtheria.

PLATE XI.—POSITIVE SCHICK REACTIONS.

The test arms only are shown, the control arms being unaffected

Figs. A and B show positive reactions in a boy at 3 days and 7 days respectively.

Figs. C and D.—Above: positive reactions in an adult at 3 days and 7 days respectively.

Below: positive reactions in the same adult at 10 days and 14 days respectively. The lower of each pair of reactions resulted from an inoculation performed 7 days before the upper.

Note that at 7 days the reaction is as strong as at 3 days, though showing desquamation. It is still evident as a pigmented patch after 14 days.

PLATE XII.—NEGATIVE AND PSEUDO REACTIONS.

Figs. A and C show the test arm, and *Figs. B and D* the control arm, at 2 days (*Figs. A and B*) and at 7 days (*Figs. C and D*). This is a well-marked pseudo-reaction in a boy. There is no difference between the test and the control, the lesion is slightly oedematous, and rather more blue than a positive reaction. In less marked cases the reaction is often completely faded in 7 days.

PLATE XIII.—POSITIVE AND PSEUDO (COMBINED) REACTIONS.

Figs. A and C show the test arm and *Figs. B and D* the control arm, at 3 days (*Figs. A and B*) and at 7 days (*Figs. C and D*). At 3 days the test lesion is larger in size and stronger in colour than the control lesion, while there is a contrast between the centre and the periphery of the test lesion. At 7 days the test lesion is still strong in colour and desquamating, while the control has almost faded.

(*Plates XI-XIII* are drawn from preparations of Surgeon-Commander S. T. Dudley, R.N., and reproduced by kind permission of the Medical Research Council from their Report on *Diphtheria*.)

J. Chalié, Brochier, A. Chaix, and Grandmaison,⁶ while not denying the importance of myocarditis, maintain that the intoxication in malignant diphtheria is due to several factors, particularly the virulence of the bacillus and the failure of systemic resistance. Two organs are pre-eminently affected, the kidneys and the suprarenals. The azotæmia resulting from diphtheritic nephritis is one of the principal signs of intoxication, another factor of which is the non-destruction of the organic poisons due to inhibition of the antitoxic function of the suprarenals following degeneration and hæmorrhage in these organs.

SYMPTOMS AND COMPLICATIONS.—L. Ribadeau-Dumas and Chabrun⁷ examined the nasal mucus of infants in various maternity hospitals in Paris suffering from rhinopharyngitis, and found that 127 out of 986 cultures (12.6 per cent) were positive. Although diphtheria carriers at this age are common, actual *diphtheria in infancy* is rare, ranging from 0 to 0.3 per cent according to various observers. In a series of 2600 cases of diphtheria of all ages under his care in the course of twelve years, the reviewer,⁸ whom the writers quote, had only

20 in the first year of life. The commonest form is nasal diphtheria. As a rule the symptoms are mild, and general disturbance is almost entirely absent. In exceptional cases, however, constituting 1·2 per cent of the writers' series, paralysis may occur, as well as a choleric form syndrome in which there is an association of symptoms of gastro-enteritis and cardiobulbar manifestations. In some cases there is a protracted cachexia in which none of the symptoms resemble diphtheria. The writers suggest that the natural immunity of the infant to diphtheria should be reinforced by injecting the mother with anatoxin during pregnancy.

F. Imianitoff⁹ records a unique case of *diphtheritic urethritis*. The patient was a man, age 24, who six days after buccal coitus developed inflammation of the urethral meatus. A yellowish discharge appeared on the ninth day, and rapidly increased. The condition was at first mistaken for a second attack of gonorrhœa, the first having occurred two years previously. In spite of the ordinary treatment for gonorrhœa the condition became worse, and on one evening the patient was unable to micturate until he took a hot bath, when a piece of membrane was expelled from the urethra. Bacteriological examination showed the presence in the urethral discharge of Klebs-Löffler bacilli, which proved virulent to guinea-pigs. Two successive doses of 3000 units of antitoxin were given, and the discharge completely ceased. Subsequent inquiry showed that the patient's partner was suffering at the time from a sore throat which was probably diphtheritic.

As the result of the study of *carbohydrate metabolism* in diphtheria, F. J. Hector¹⁰ comes to the following conclusions: (1) In severe diphtheria during the stage of toxæmia and acidosis, carbohydrate metabolism is disturbed and unstabilized. In the first place the concentration of the fasting blood-sugar is abnormally low. Secondly, there is a marked defect in the storage mechanism. Thirdly, the ability of the tissue to utilize glucose is diminished. (2) The disorganization of carbohydrate metabolism passes away with the stage of diphtherial intoxication. (3) The cause of the metabolic disorder is probably interference with the function of the liver, the endocrine glands, and the nervous system, by the action of the diphtheria toxin.

DIAGNOSIS.—E. C. Wilcox¹¹ reports a case of *foreign body in the tonsil simulating diphtheria*. The patient was an eight-weeks-old female infant, sent to hospital as a case of laryngeal diphtheria. There was, however, no true laryngeal stridor, the obstructive symptoms were intermittent, and there was no recession of the chest walls except momentarily, when a quantity of mucus collected at the back of the throat and temporarily impeded respiration. Examination of the throat showed much faucial swelling, and after swabbing out the mouth and fauces a pin of a brooch was found embedded in the right tonsil. With some difficulty it was removed with tracheotomy forceps, and subsequent recovery was uneventful. C. J. Hill Aitken¹² records an exactly opposite case of *diphtheria simulating a foreign body in the throat* in a woman, who was sure that a fish-bone had stuck in her throat, but was found to be suffering from diphtheria of the larynx.

The Schick Test.—Four varieties of the Schick test are described, viz.: (1) Negative; (2) Positive; (3) Pseudo, or negative and pseudo; (4) Combined, or positive and pseudo. The last three are illustrated in *Plates XI, XII, XIII*, which are reproduced by the kind permission of the Medical Research Council from their monograph *Diphtheria* (1923).

1. The *negative* reaction is a complete absence of reaction.

2. In the *positive* reaction a red flush appears at the site of intracutaneous inoculation of diphtheria toxin within 24 to 48 hours and reaches its maximum in 4 days, when it forms a circumscribed swollen area measuring 1 to 2 cm. in

diameter. It then slowly fades in a further 7 to 10 days to a circumscribed brownish tint with desquamation of the epidermis. (*Plate XI.*)

3. The *negative* and *pseudo* reaction develops rapidly both on the arm injected with untreated toxin and on the control arm injected with toxin which has been heated to 75° to destroy all the toxin. By the fourth day the reaction has mostly disappeared, but often leaves a reddish or brownish pigmentation with some desquamation. (*Plate XII.*)

4. In the *positive* and *pseudo* reaction the pseudo effect develops rapidly on both arms, and as it fades the true positive reaction appears on the test arm. (*Plate XIII.*)

(1) and (3) indicate immunity, and (2) and (4) susceptibility, to diphtheria.

According to M. Haidvogel,¹³ Schick carried out his first tests cutaneously with a Pirquet vaccinostyle, and only later substituted the intracutaneous method now generally adopted. [The cutaneous method has recently been revived by Kassowitz (*see* MEDICAL ANNUAL, 1925, p. 113), who obtained the same results as with the intracutaneous method and found the technique much more simple.] The subcutaneous method does not seem to have been employed for the Schick reaction before, although it has been found to work admirably for tuberculin tests. Haidvogel has performed the test intra- and subcutaneously on twenty-six children, and found that there was complete agreement between the two reactions. The advantages of the subcutaneous method are that it is simpler than either the cutaneous or intracutaneous method, that it is much less painful than the intracutaneous, that it can be performed very quickly, and that it admits of as exact a dosage as the intracutaneous method.

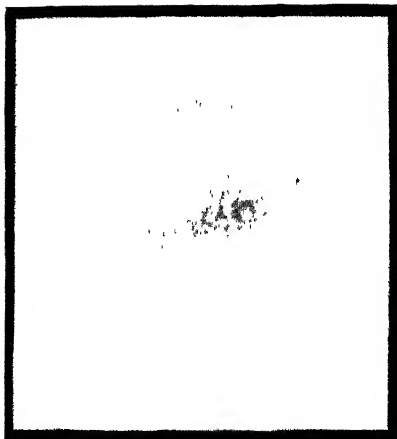
PROPHYLAXIS.—J. Graham Forbes,¹⁴ who alludes to the reviewer's paper on the recent increase of diphtheria in London (*see* MEDICAL ANNUAL, 1927, p. 112), has drawn up a valuable report in which he reviews the diphtheria prevention work in Great Britain, the United States, and other parts. He shows that in England and Wales, since the adoption of preventive measures, roughly 1-1500 has been Schick tested and 1-4650 immunized, whereas in Scotland it is estimated that 1-175 has been Schick-tested and 1-275 has been immunized, so that the immunization-rate is seventeen times greater in Scotland than it is in England and Wales. In Edinburgh in particular there is a very apparent reduction in the incidence of diphtheria among immunized school children, and a total absence of mortality. The value of the Schick test and preventive inoculation by Toxin-antitoxin has been amply demonstrated among the staffs of fever hospitals and in residential schools and other institutions, where since their introduction diphtheria has been either entirely absent or considerably reduced. In the United States, where preventive work has been carried out on a much larger scale than in Great Britain, the fall in the incidence and mortality of diphtheria has been still more striking.

The use of Anatoxin introduced by G. Ramon (*see* MEDICAL ANNUAL, 1925, p. 113; 1926, p. 128; 1927, p. 115) seems to have taken the place of toxin-antitoxin in France, as is seen from the reports by Ramon¹⁵ himself, M. Mozer,¹⁶ M. F. Germane,¹⁷ J. F. M. Leviez,¹⁸ P. Mirault,¹⁹ and to be extending to other countries such as Spain (J. Y. L. Megias and F. Moreno de Ulga²⁰); Russia (P. Sdrodowski and K. Chalapina,²¹ M. P. Glusmann, J. W. Solowjewa, and N. Gladstern²²); and South America (J. L. Monteiro²³). Inoculation of anatoxin by the *nasal* route has been carried out on 124 subjects (children and adults) by Lesné, Marquezy, Lemaire, and Monmignant,²¹ with the result that in forty days more than 90 per cent became immune. Three or four drops of pure anatoxin were instilled into each nostril in some cases for eight consecutive days, and then, after an interval of eight days, for another eight days. Anatoxin therefore, like adrenalin, can be absorbed into the system, and if the

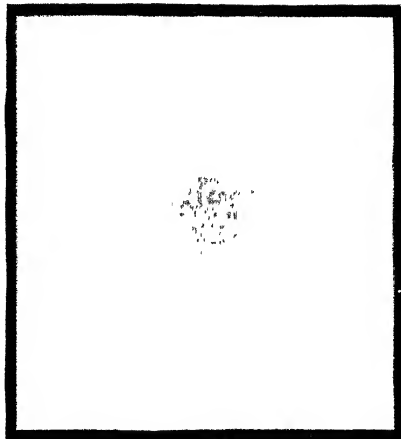
PLATE XI

SCHICK TEST: POSITIVE REACTIONS

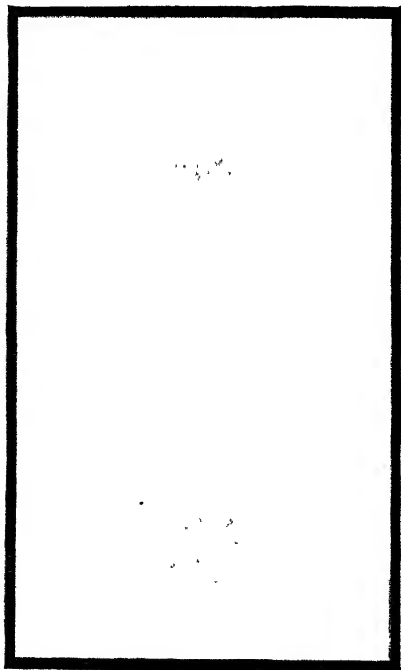
A



B



C



D

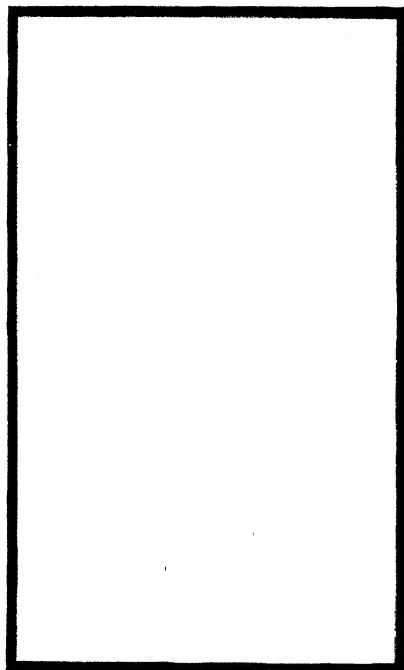
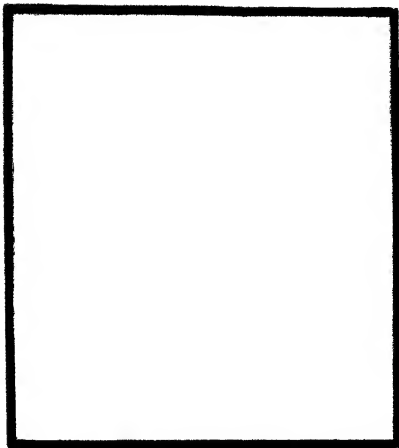


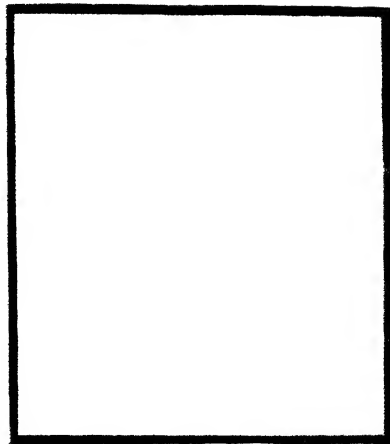
PLATE XII

SCHICK TEST NEGATIVE AND PSEUDO REACTIONS

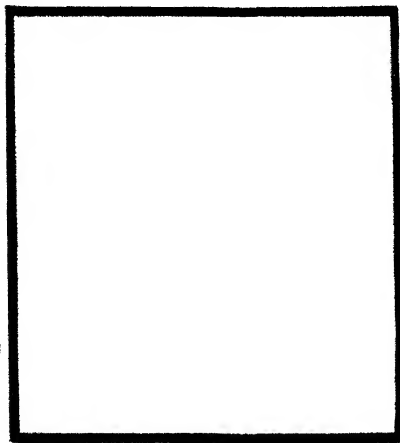
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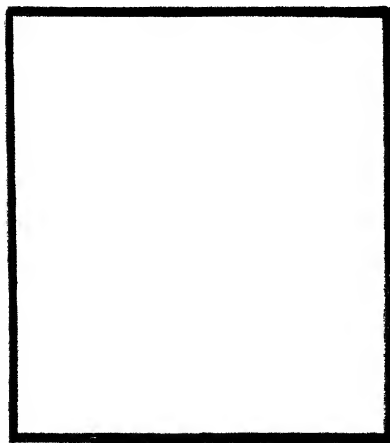
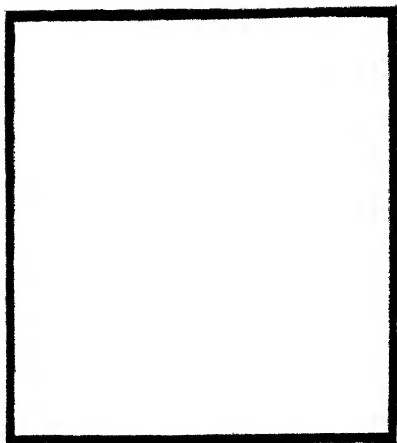


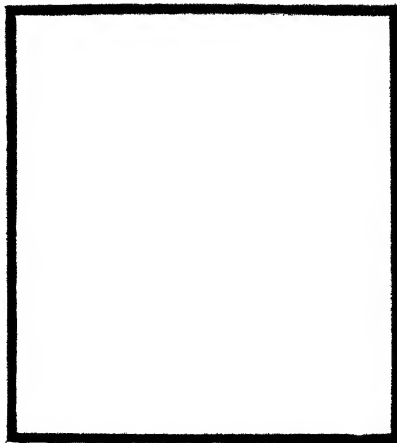
PLATE XIII

SCHICK TEST · POSITIVE AND PSEUDO (COMBINED) REACTIONS

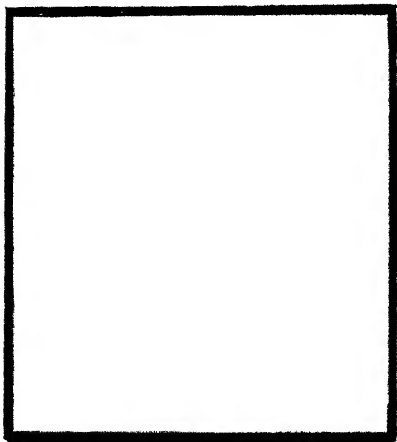
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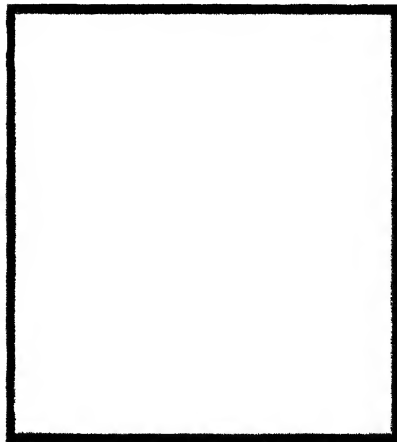
B



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D



value of this method is confirmed will doubtless prove more acceptable than subcutaneous inoculation. C. Zeller and G. Ramon,²⁵ who suggest that the development of immunity by the nasal route explains the mechanism of spontaneous immunization (see MEDICAL ANNUAL, 1926, p. 127), point out that the only drawback to this method is that it is impossible to be certain how much anatoxin has been absorbed, for some may be expelled from the nostrils or pass down into the œsophagus. More anatoxin, therefore, must be used, so that intranasal inoculation is not so economical as subcutaneous injection.

An unfortunate accident, recalling the disaster which took place at Baden, near Vienna (see MEDICAL ANNUAL, 1927, p. 114), is reported by J. J. Jakovleva²⁶ at Moscow. Fourteen healthy children were inadvertently given injections of diphtheria toxin instead of anatoxin, with the following results. Eight died within a fortnight and four within a month, with symptoms of polyneuritis, while two recovered after presenting symptoms of general intoxication.

The liability of toxin-antitoxin to cause hypersensitiveness has recently been illustrated by W. E. Gatewood and C. W. Baldridge²⁷ clinically and by A. Stewart²⁸ experimentally as well as clinically. The cases of Gatewood and Baldridge were in adults who had previously been given toxin-antitoxin and on injection with diphtheria or scarlet fever antitoxin developed the phenomenon of Arthus, i.e., local necrosis at the site of the injection of serum. To avoid this occurrence the writers recommend the use of a serum other than that of horses, such as goats' serum, or a toxin detoxified by sodium ricinoleate (see MEDICAL ANNUAL, 1927, p. 115).

TREATMENT.—Further reports have recently been made on the **Refined Diphtheria Antitoxin** prepared by Ramon, to which allusion was made in the last issue (1927, p. 115). While Lesné, Papillon, Driart, and Stieffel²⁹ speak highly of it, Lereboullet,³⁰ Grenet,³¹ and Cathala³² maintain that, whatever advantages refined serum may possess in the prevention and treatment of moderate attacks, ordinary serum is more efficacious in malignant attacks in which larger doses are necessary.

In an address dealing with the practical results of recent researches in acute infectious diseases, J. D. Rolleston³³ stated that it was more than twenty years since he had given up the therapeutic use of Alcohol, but it was only within the last ten months, since his appointment as medical superintendent, that he had been able to induce his colleagues in the fever hospital to follow his example. During that time the amount of alcohol ordered on the diet sheet had fallen from an average of about 30 oz. daily to nil, without any evil effects, the mortality from diphtheria, on which most of the alcohol was used, being lower in 1926 (4.53 per cent) than in the previous year (5.19 per cent). During the last quarter of 1926 the total amount of brandy ordered though not consumed was only 2½ oz., as compared with 1112 oz. during the corresponding period of the previous year, the average number of patients under treatment in these two periods being about the same (about 400 on any given day).

Treatment of Carriers.—The value of X-ray Treatment to which reference was made in a previous issue (see MEDICAL ANNUAL, 1926, p. 129) has been confirmed by S. Withers, J. E. Ranson, and E. D. Humphrys³⁴ from their experience of 54 cases.

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de Paris, 1926, No. 313; ¹⁸*Ibid.* No. 606; ¹⁹*Ibid.* 641; ²⁰*La med. Ibera*, 1926, 533; ²¹*Centralbl. f. Bakt.* Abt. 1, ci, 350; ²²*Zeits. f. Hyg.* 1927, cvii, 130; ²³*Mém. de l'Inst. de Butantan*, 1926, 26; ²⁴*Compt. rend. Soc. de Biol.* 1927, xcvi, 1205; ²⁵*Ibid.* xcvi, 819; ²⁶*Bull. de l'Inst. Pasteur*, 1927, 849; ²⁷*Jour. Amer. Med. Assoc.* 1927, lxxxviii, 1068; ²⁸*Ibid.* 1220; ²⁹*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1927, 235; ³⁰*Ibid.* 238; ³¹*Ibid.* 240; ³²*Ibid.* 281; ³³*Clinical Jour. the HIP*, lvi, 109; ³⁴*Jour. Amer. Med. Assoc.* 1926, lxxxvii, 1266.

DISLOCATION OF THE HIP, CONGENITAL. (*See HIP-JOINT, SURGERY OF.*)

DRUG ADDICTION.—(*See ALCOHOL AND DRUG ADDICTION.*)

DRUNKENNESS, TESTS FOR.

Joseph Priestley, B.A., M.D., D.P.H.

Ordinary Tests for Drunkenness.—Of all medico-legal subjects, testing for drunkenness is one of the most difficult, being beset with well-known pitfalls on all sides. The day is long past of the 'chalked line', or the saying of words such as 'truly rural', 'terminological inexactitudes'. These simple tests were in connection with the subject of drunkenness in its infancy: the matter is a totally different one to-day, when the necessary crossing of a street by an ordinary sober man or woman might certainly be regarded as a sure proof of drunkenness, if not something far worse!

The whole question, therefore, requires revision, so as, if possible, to be brought up to modern requirements. The matter, however, is not a simple one by any means: on the contrary, it is a most complex one, as has been found to be the case by the British Medical Association's Committee, which was appointed on Oct. 21, 1925, with the following reference: "To consider and report on the present tests for 'drunkenness' with recommendations as to their modification or improvement". The Committee consisted of well-known general practitioners, police surgeons, magistrates, scientists, and others, under the chairmanship of Major-General Sir William Macpherson. Many sessions were held by the Committee during 1926, and the Committee's Report was received by the Council of the Association on Feb. 8, 1927, and was ordered to be published. This Report was really the outcome of a request received by the British Medical Association from the Association of Metropolitan Police Surgeons; but the Report, as such, will not satisfy the expectations of the outside public, or even those of a section of the medical profession. The least reliable tests have been eliminated. It is only fair to state this fact.

The first difficulty that the Committee had to meet was to decide upon a definition of 'drunkenness'. What is, really, a 'drunk'? It was decided to narrow the inquiry by dealing only with *alcoholic* 'drunkenness' or an *alcoholic* 'drunk', though it was admitted that alcohol is not the only substance capable of producing similar symptoms. The result of the Committee's deliberations was the following definition of the word 'drunk':—

"That the person concerned was so much under the influence of alcohol as to have lost control of his faculties to such an extent as to render him unable to execute safely the occupation on which he was engaged at the material time."

Having got so far, the Committee turned its attention to the tests at present in use and those recently suggested, and came to the conclusion that the principles underlying *all* tests might be grouped as follows:—

1. Whether the person concerned has recently consumed alcohol;
2. Whether the person concerned is so much under the influence of alcohol as to have lost control of his faculties to such an extent as to render him unable to execute safely the occupation on which he was engaged at the material time;
3. Whether his state is due, wholly or partially, to a pathological condition, which causes symptoms similar to those of alcoholic intoxication, irrespective of the amount of alcohol consumed.

In regard to paragraph (1), 'smell' is a practical and ready test to hand—such 'smell' depending upon the nature of the liquor consumed and the time that has elapsed since its consumption. Keeness of the sense of smell varies in different examiners, and, further, allowance must be made for the well-known powers of various substances to disguise the smell of alcohol in accused persons, wholly or in part.

In regard to paragraph (2), the real difficulties begin. There are no tests universally applicable, the effect of alcohol varying within wide limits in different individuals and, in the same individuals, under differing conditions. The first effect of alcohol is on the higher centres of the nervous system and is subjective, but there is no single test, taken by itself, which would justify a decision that the amount of alcohol consumed had abolished control of the faculties to a dangerous point in the suspected persons. Several tests and observations are needed in combination, e.g., general demeanour; state of clothing; appearance of conjunctivæ; state of the tongue; smell of the breath; character of the speech; manner of walking, turning sharply, sitting down and rising, picking up a pencil or coin from the floor; memory of incidents within the previous few hours, and estimation of these time-intervals; reaction of the pupils; character of the breathing, especially in regard to hiccup. The Committee definitely states that, taken by themselves, the following tests are unreliable: rapid pulse (tachycardia); repetition of set words or phrases; character of handwriting; walking along a straight line; failure of convergence of the eyes.

Paragraph (3) is the most important, as it states very definitely that there is no single symptom due to the consumption of alcoholic liquor which may not also be a sign of some other pathological condition, e.g., severe fevers, acute inflammatory lesions of the brain or the cerebral meninges (and, of course, other less acute lesions of the central nervous system), mental and nervous disorders, diseases in which general metabolism is probably at fault, the results of head injury, vascular lesions of the brain, the acute effects of drugs, the chronic effects of chemicals, the effects of the extremes of temperature, excessive loss of blood, Stokes-Adams disease, sudden nervous shock, hysterical trance, auto-intoxication, and acidosis!

The Report points out that diagnosis would have to be decided (a) by a clinical examination of the urine, including tests for pathological and toxicological abnormalities, and of the vomit (if any); (b) by an examination of the knee-jerks and other reflexes, the pupils, retinæ, heart, and organs of respiration; and (c) by an examination for signs of kidney disease and for signs of intracranial disease, such as retraction of the head and hemiplegia and any paralysis of the cranial nerves. The Committee add that, in their opinion, tests depending on examination of the blood, urine, or cerebrospinal fluid are not practicable owing to the conditions limiting their applications.

The Report is thorough, and the result can only be fitly described by the expression 'as you were'. Nothing fresh is suggested, but the rough-and-ready tests that have hitherto been in use are (as already stated) now taboo. Each case must be judged on its merits after a careful clinical inspection and after taking into consideration all the general evidence. In this way, the final decision as to a 'drunk' or 'drunkenness' may become one of the most difficult duties of a medical practitioner—at least, will definitely prove to be so in the future, if the findings in the Committee's Report are carefully and conscientiously followed.

Even the latest suggestion that comes from America will not solve the difficulties. It is officially suggested (medically) that the expired air of 'suspects' should be collected in a bag and analysed, *quantitatively*, as to the amount of

alcohol present, and the 'suspects' classified according to scale as 25, 50, 75, or 100 per cent (and, of course, intermediate proportions) 'drunks'! Coming from America, the suggestion must be at least mentioned.

In view of what has been stated, it will be admitted that the difficulties in differentiating between 'drunks' and other pathological conditions are considerable. There is no short cut to the diagnosis of a 'drunk', and the sooner this fact is realized by the medical profession (if it is not already realized) the better. Injustice has, undoubtedly, been done in the past, and will be repeated in the future, unless the necessary care is taken by the medical practitioners concerned. The day for extremist views has gone by, and each case must be judged on its own individual merits. It is not sufficient to leave it to a house surgeon or house physician of a hospital: on the contrary, many of the cases require the considered judgement of a Harley Street (or other) 'specialist'. Even police doctors will have to alter their routine methods and bring themselves more up to date, and more in accordance with the requirements of present-day medical knowledge. There are so many cross-currents due to modern life, or as the result of modern life, that the day is gone by for rule-of-thumb methods to be any longer possible. *Each* case must, as already stated, be judged upon its own individual merits, and, in saying that, the door is, of necessity, opened very wide. The lawyers again come in financially!

The whole question is beset with real practical difficulties. There are 'drunks' and 'drunks'. There are the acute 'drunks' (on what may be described as virgin soil) and the chronic 'drunks' (the virginity of whose soil is long past), but between these two extremes there are all sorts and conditions of grades, which can best be described as acute, or subacute, attacks of alcoholic poisoning upon a more or less chronic alcoholic basis. Where the difficulty of the medical practitioner comes in is the well-known (and now acknowledged) fact that in many cases the chronic alcoholic condition must be catered for by a further dose or doses of the poison! Many men (and women) can do nothing, in commencing the day, until they have had a 'nerve steadier'. Personally, I have known men who could not drive a motor-car (or concentrate sufficiently in ordinary business activities) without such a 'nerve steadier.' We must meet facts as they are in practice, and not as they ought to be (in theory), and, with the world as it is, and present conditions such as they are, the medical practitioner of to-day must be prepared to take every item into consideration.

Drunken Motorists' Tests.—This question is of the nature of a specialism of the main subject. Different considerations come into play. Motor driving is a very technical operation and requires a strong nerve. The slightest irregularity in the nervous system may cause a disaster. The same argument applies, medically, to aeroplaning in a greater degree. No motorist should drink (even one drink) whilst in charge of the wheel. The effect of a small dose of alcohol throws the nervous human mechanism out of gear, and trouble may arise. A very serious question that arises is in the case of taxi-cab drivers, many of whom take daily and hourly large quantities of alcohol (large when added up at the end of the day and night). Their nervous systems are chronically 'poisoned' on retiring to rest nightly (or daily, if on night shift). Are such cases really safe drivers until after they have had one or two drinks to 'steady themselves', as they call it? In other words, as a fact, a chronic alcoholic motor driver is more reliable when he or she has steadied himself (or herself) with the usual morning 'nerve steadier'. It may be sad to admit that it is so, but unfortunately it is.

It is easily understood that the question of drunken motorists' tests is one requiring great care and consideration before laying down any hard-and-fast rules. The British Medical Association at its meeting in Edinburgh in 1927

shelved the question. The Association was wise in so doing, having regard to all the available facts and medical (and other expert) opinions and views upon what is a very wide and not yet properly understood subject.

DUODENAL ULCER. (*See GASTRIC AND DUODENAL ULCER.*)

DYSENTERY, AMŒBIC. (*See AMŒBIASIS.*)

DYSENTERY, BACILLARY. *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

There is little to report on this disease. I. J. Kligler¹ records the results of careful bacteriological examination of the stools of dysentery patients in Palestine for fifteen months, with the result of obtaining cultures, usually within forty-eight hours, and finding that the proportion of bacillary dysentery to the amœbic disease was raised from 1 to 4 to 2 to 1, as compared with previous laboratory returns of this country. Formerly various cellular forms in bacillary dysentery stools must have been mistaken for amœbæ as elsewhere, and the technique for isolating dysentery bacilli was not sufficiently accurate. Of 307 dysentery cases examined, repeatedly when necessary, 65 per cent proved to be bacillary, mostly of the Flexner-Hiss type, and only 35 per cent amœbic. G. C. Maitra and J. B. Basu² report on a trial of **Oral Vaccination** against bacillary dysentery in Indian jails. They used either compressed tablets of desiccated bili-vaccine of dysentery bacilli, or a mixed and sterilized emulsion of Shiga and Flexner bacilli prepared in the Calcutta School of Tropical Medicine, and obtained with the former a reduction in the dysentery incidence among 509 vaccinated to 2.16 per cent against 4.46 per cent among 1053 controls; and with the latter, among 627 vaccinated, 2.88 per cent dysentery incidence against 5.2 in 4516 unvaccinated; the results were thus favourable with both preparations.

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EAR, DISEASES OF.

A. J. M. Wright, M.B., F.R.C.S.

EXTERNAL EAR.

Otitis Externa.—Inflammation of the auricle and meatus is frequently painful, difficult to cure, and may present problems in diagnosis. Dan McKenzie,¹ in introducing a discussion at the Royal Society of Medicine, pointed out that the auditory meatus is the only skin-lined cul-de-sac in the body, and that this fact may introduce certain special characters into its diseases. The following is a summary of some of the suggestions made.

Furunculosis.—McKenzie stated that it is occasionally impossible to diagnose between a furuncle of the posterior wall and a mastoid suppuration, except at operation. He had found Vaccines sometimes helpful in checking recurrences. He also alluded to, what is probably a rare complication, the extension of the infection along the walls of the bony meatus to the middle ear. A. M. H. Gray suggested that the reason for the lack of uniformity in the results of the use of vaccines was that in some cases a local source of infection was present, while in others the chief factor was a lowering of the general resistance.

F. H. B. Norrie² has obtained uniformly good results by **Ionization with Salicylate of Soda**. The technique he advises is as follows: After a preliminary cleaning, the meatus and crevices of the auricle are lightly packed with gauze. This is saturated with 2 per cent solution of salicylate of soda, and the ear is covered and surrounded with a similarly soaked pad of wool two layers

thick. Over all this is placed a pad of towels sixteen layers thick, also saturated. The negative terminal is firmly bandaged over this pad to the head, and the opposite terminal applied to the arm or leg over a thick saline-soaked pad. The current is slowly turned on to a maximum of 5 ma. and allowed to flow for ten to fifteen minutes. It is then increased to from 10 to 30 ma., and this is allowed to pass for two hours. At the conclusion it is slowly reduced. It is stated that resolution is rapid and that the treatment seldom has to be repeated.

Desquamative Otitis Externa.—McKenzie³ states that in this condition the lining of the canal becomes shed in continuous large sheets which accumulate in a moist and sodden condition. In old-standing cases the deep meatus may become expanded, pain may be induced, and some ulceration of the walls take place. Great difficulty may be occasioned in clearing out the mass, the syringe being ineffective and instrumental removal with a blunt scoop necessary, preferably under an anæsthetic. H. Tilley has found that these masses can be softened and removed with the syringe by free daily applications of the following solution :—

R	Sod. Bicarb.	ãã gr. xx	Aq.	ãã ʒss
	Sod. Salicyl.	¶j	Glycerin.	
	Acid. Carbol.			

Otomycosis.—McKenzie stressed the fact that these cases are not very infrequent and are often unrecognized. Various fungi may be responsible, and, if present, the occurrence of minute black dots, the spores, on a whitish membrane, will establish the diagnosis. In all cases of obstinate inflammation of the meatus, some of the débris should be examined microscopically for a mycelium. Filling the meatus with alcohol daily will cure.

Chronic Eczema.—An effort should be made to exclude suppuration in the middle ear as the primary cause. If the discharge is decidedly purulent, the middle ear is probably involved and inflation with auscultation may establish the presence of a perforation of the membrane. In the acute stage, McKenzie advises painting the meatus with a solution of **Silver Nitrate** 30 gr. to the ounce, followed by drops of **Glyc. Plumb. Subacet.** 1 dr. in 1 oz. of water. In the more chronic stages, 10 per cent **Ichthyol** with **Zinc Oxide** and **Calamine** in liquid **Paraffin** are used as drops. Watery applications should be avoided.

F. C. Ormerod,⁴ for cases of dermatitis secondary to a middle-ear suppuration, has found a painting of a solution of **Silver Nitrate** in **Spirit of Nitrous Ether** helpful, particularly in cases associated with fissuring and perichondritis of the auricle. In eczematous cases the best results were obtained by packing the meatus with narrow strips of gauze smeared with **Calamine** ointment. These strips are replaced daily or at longer intervals. Operation on the middle ear should be avoided when possible, owing to the risk of perichondritis of the auricle, with deformity.

Hæmorrhagic Otitis.—Of late years, the occurrence of cases of inflammation of the ear associated with a hæmorrhagic discharge has been relatively frequent, and this condition seems to be associated with epidemics of influenza. The inflammatory condition sometimes affects the meatus, sometimes the middle ear, and probably also sometimes the labyrinth, or any of these parts in combination. On examination of such a case, the characteristic appearance is the presence of hæmorrhagic bullæ situated in the deep meatus and on the surface of the membrane. In cases in which the middle ear is also involved, the whole membrane becomes intensely engorged, and such cases not uncommonly are extremely acute in type, with early and extensive infection of the mastoid process. In cases in which one is reasonably certain that the middle ear is not involved, nothing is required in the way of treatment except perhaps the

dusting into the ear of a little **Boracic Powder**. The bullæ either rupture with a bloody discharge or shrivel up. Where any doubt exists as to the implication of the middle ear, a free **Paracentesis** should be done and a close watch kept for mastoid involvement. In regard to the labyrinth, Sir William Milligan⁵ suggests that the cases of nerve deafness with tinnitus, so commonly met with after influenza, are to be explained by a hæmorrhagic exudate into the labyrinth. In cases in which the signs and symptoms suggest such a condition, he advises **Lumbar Puncture** and repeated subcutaneous injection of **Pilocarpine**.

MIDDLE EAR.

Chronic Suppurative Otitis Media.—

Non-operative Treatment.—The detail of technique of **Ionization** was given in the **MEDICAL ANNUAL** for 1927. W. E. Crosbie⁶ gives his experiences with the method. He states that zinc ionization has given excellent results in his hands, cure resulting in at least two-thirds of the cases. He emphasizes the importance of previously dealing with any septic focus in the nose, mouth, or throat, and finds that the earlier the treatment is carried out, the better are the results. John Horn⁷ reports good results from the use of **Credé's Ointment**, i.e., 15 per cent collargol. This he employs as follows: After a preliminary cleaning of the ear with hydrogen peroxide, a 20 per cent solution of the ointment in liquid paraffin is swabbed into the tympanum, and the meatus filled with a strip of gauze dipped in a similar solution. This is renewed every second day.

Operative Treatment.—*Aural polypus* is, for practical purposes, the result of a chronic suppuration and indicates chronicity with bone disease. W. W. Woodhouse⁸ has investigated the after-results of the simple removal of the polypus to ascertain the utility of this relatively slight operation. The material comprised 48 cases from the Edinburgh Royal Infirmary over a period of five years. Of these, 60 per cent showed an ear free from suppuration, and 25 per cent had some discharge but no recurrence of the polypus. It would therefore certainly seem worth while to remove a polypus from the ear in chronic suppuration before deciding that any more extensive operation is necessary. This, of course, presumes that no evidence of complications are present.

After-treatment and Results of the Mastoid Operations.—In the **MEDICAL ANNUAL** for 1927 the question of the type of operation advisable in particular cases was dealt with. As a corollary to this, the question of after-treatment and results was discussed at the annual meeting of the British Medical Association in 1926.⁹ G. J. Jenkins, dealing with the Schwartze operation for acute mastoiditis, emphasized the fact that a thorough operation was the most important factor in facilitating recovery. He usually leaves the wound open in whole or in part, packing the cavity lightly with iodoform gauze. Only occasionally, when the cavity is so small that the soft parts will practically obliterate it, will he perform primary suture. Secondary suture is used in cases in which there is serious delay in healing. H. Neumann also regarded thoroughness in eradicating infection at the primary operation as the most important factor in healing. *Fistulæ* after operation, when they occur, are most commonly due to an incomplete operation. J. S. Fraser is a strong advocate of the **Immediate Skin-graft** in the radical operation. Where a skin-graft is employed he has found an improvement in hearing in more than half the cases, while where the graft is not used the results are not so good. This is probably owing to the greater fibrosis on the inner tympanic wall.

A Local Anæsthetic for the Ear.—The discovery of an anæsthetic which, applied to the tympanic membrane, would really produce anæsthesia, would be very valuable. F. P. Sturm¹⁰ claims that a mixture is effective which

consists of equal parts of cocaine hydrochloride, menthol, crystallized carbolic acid, rectified spirit, and oil of cloves. This solution must be applied against the membrane on a cotton-wool mop and left for ten minutes. It is said that operations on the membrane and middle ear can then be carried out painlessly. It should not be allowed to touch the walls of the external meatus, as it may set up an otitis externa. F. P. M. Clarke¹¹ advises the following solution as being equally effective and not possessing the disadvantage just mentioned. It consists of cocaine 3 parts, potassium sulphate (2 per cent sol.) 20 parts, adrenalin (1-1000) 10 parts, carbolic acid solution ($\frac{1}{2}$ per cent) to 100 parts.

Complications of Suppurative Otitis Media.—

Gradenigo's Syndrome.—This consists in severe temporoparietal neuralgia, with paralysis of the external rectus (sixth nerve) on the same side, associated with an acute inflammation of the middle ear. The attention given to this syndrome in recent years has shown that it is not uncommon. H. G. Escourt,¹² in a general review of the subject, supports the now generally accepted view that the paralysis and neuralgia are due to a spread of the inflammatory process from the middle ear to the apex of the temporal bone, thus involving the fifth and sixth cranial nerves. In the majority of cases the condition resolves without treatment, but occasionally a meningitis or other serious lesion eventuates. Opinions therefore differ as to the line of treatment which should be followed. Escourt advises that where there is no other sign of mastoid disease, and the patient can be carefully watched, palliative treatment can be employed for a week or ten days, the patient being kept in bed, the otitis media treated on usual lines, and counter-irritants applied around the ear. If, after this period, pain still persists, the mastoid should be operated on. E. Rimini,¹³ on the other hand, in view of the occasional onset of meningitis, advises operation in all cases at the earliest possible moment.

Examination of the Cerebrospinal Fluid.—The significance of the changes disclosed by a cytological examination of the cerebrospinal fluid was dealt with in the MEDICAL ANNUAL for 1927. To complete this, the significance of chemical changes in the fluid, as detailed by J. G. Greenfield,¹⁴ is now given. The table below gives the proportion of crystalloid constituents in the normal and in meningitis. It will be seen that the proportion of both glucose and the chlorides is much diminished in cases of meningitis. The estimation of the chlorides is relatively simple and of considerable prognostic value. A considerable diminution in the chloride is indicative of damage to the choroid plexus,

CRYSTALLOIDS IN BLOOD AND CEREBROSPINAL FLUID (NORMAL AND IN MENINGITIS).

(Figures given in mgrm. per 100 c.c. of fluid.)

Blood Plasma			Normal C.S.F.	Meningitis
Chlorides	.. ..	560 to 620 (de Wesselow)	725 to 750	600 to 680
Glucose	.. ..	100	55 to 65	0 to 30
Urea	.. ..	10 to 30	10 to 30	No change
Calcium (diffusible)	.. ..	6 to 7 (Critchley and O'Flynn)	5.7 to 6.8	No change
Magnesium	.. ..	2.2 to 3	3 to 3.5	2 to 3
Phosphates (as inorganic P)	.. ..	2.8 to 6.3 (Cohen)	1.5 to 2	2 to 3
Sulphates	.. ..	2 to 4 (de Wesselow)		
Uric acid	.. ..	4 (Denis)	1	Above 1
	.. ..	3 mgrm. (average) (Bernhard)	0.3 to 1.3	1.1 to 4.8

and therefore of a widespread meningitis. On the one hand, with a cerebrospinal fluid which may be turbid, with a high cell content, if the chloride percentage is normal, there is at any rate a possibility that the condition may resolve. On the other hand, a clear fluid, with only a small cell increase, may show a diminution in the chloride content and therefore indicate a bad prognosis. The chloride content is of more importance in prognosis than the percentage of glucose.

Treatment of Meningitis.—The treatment of septic meningitis due to infection from the ears or nasal cavities is receiving considerable attention, and the results are probably showing some improvement. Linck¹⁵ points out that the factors needing attention are the diminution of intracranial pressure, the combating of bacterial action, and the improvement of the patient's general condition. The relief of intracranial pressure is obtained by lumbar puncture, supplemented in most cases by suboccipital puncture, the latter being effective when, owing to blockage, the removal of fluid lower down is ineffective. Suboccipital puncture is probably more effective than drainage by incision of the dura. Up to the present the value of the introduction of bactericidal fluids into the cerebrospinal system is unproven. A thorough eradication of the primary septic focus is, of course, all-important.

John Koliner¹⁶ has carried out work on the treatment of experimentally induced septic meningitis in dogs. He has found no good results from the injection of bactericidal substances into the cerebrospinal system. On the other hand, lavage from the lateral ventricle through to the cisterna magna cured cases if carried out early in the disease.

Non-suppurative Middle-ear Deafness.—The restoration of the patency of the Eustachian tube, in cases of catarrhal middle-ear conditions, is often of extreme value, and the earlier that it is carried out the better are the results. Dundas Grant¹⁷ strongly advocates the use of Weber-Liel's catheter for this purpose. He points out that the inflammatory condition present tends to implicate particularly the Eustachian tube, and that the resulting obstruction from swelling is a very real factor in producing the secondary changes in the middle ear which are responsible for the deafness. Owing, however, to the fact that the Eustachian tube is sinuous, the ordinary method of inflation through a metal catheter is often inefficient. Weber-Liel's tube, being flexible, adapts itself to the curves and has the advantage over a flexible bougie that inflation can be performed through it. The tube is a fine gum-elastic one which can be passed through a metal catheter and, projecting through its end, pass up the Eustachian tube. It is graduated on the proximal end to show its depth of penetration into the Eustachian tube. The method of its use is as follows: After a preliminary cocaineization of the nose, a large silver catheter is passed and a little cocaine solution sprayed through it into the Eustachian tube. Two drops of liquid paraffin are then blown in through the catheter with a Politzer bag. The Weber-Liel tube is now introduced until it impinges on the wall of the Eustachian tube, then rotated slightly on its long axis, so as to raise its tip, and, at the same time, the outer end raised without letting the inner end shift. The inner tube can then, in most cases, be pushed further up the Eustachian tube to a depth of from 1 to 1½ cm., its correct position in the tube being checked by inflation through it.

Radium Treatment.—Among the methods of treatment which are being tried in cases of chronic middle-ear defects, the use of radium is one which would seem to have some theoretical justification. Walter Stevenson and T. G. Wilson¹⁸ point out that radium has the property of softening fibrous tissue and of arresting the progress of chronic inflammatory processes. It might be hoped, then, that its use, combined with some mechanical stretching

of the softened fibrous tissue, would improve the hearing in cases of deafness due to fibrosis in the middle ear, while its effect on an active inflammatory condition should prove of benefit. In cases of otosclerosis, on the other hand, it has been sometimes observed that an acute inflammation of the middle ear will arrest the course of the disease, and, by analogy, the hyperæmia, etc., induced by radium might produce a similar effect. The authors have treated 8 cases—3 of otosclerosis and 5 of chronic middle-ear catarrh. From the case histories given, useful improvement in hearing was noticed in 6 of the 8 cases, 2 of these being otosclerosis. The results, although few in number, would seem to be sufficiently encouraging to justify a trial. In addition to radium applications, the cases were inflated through a Eustachian catheter thrice weekly. The method of applying the radium was as follows: A glass capillary emanation tube was placed in a brass tube 1.75 mm. thick and 3 cm. long by 5 cm. external diameter. This cuts off all the beta rays. The brass tube was inserted into the meatus, so that its end was about 1 mm. from the membrane, the tube projecting from the ear and held firmly in place by cotton-wool and steadied by strapping. Both ears were treated at the same time, and the tubes removed after twenty-four hours. The strength of the emanation tube is not given.

Otosclerosis.—In the MEDICAL ANNUAL for 1927, evidence was given which tended to connect this disease with *endocrine mal-function*. Evidence is accumulating which seems to support this view. Hugo Frey¹⁹ considers that, while other glands may be faulty, a hypofunction of the parathyroid is a factor in the majority of cases. On this assumption he has had a number of cases treated by X-ray Radiation to the Pituitary, Thyroid, and Parathyroid Regions, and the results of treatment seemed, in some cases, to have tended towards the arresting of the disease. Dana Drury²⁰ considers that in about two out of three otosclerotics endocrine malfunction is a factor. He emphasizes the importance of trying to decide which of the endocrine glands is at fault in any particular case, so that treatment may be adapted accordingly. Charles Lawrence,²¹ in a study of 31 cases of otosclerosis, came to the conclusion that, in 14 out of 19 cases treated by an extract of the gland at fault, improvement resulted.

E. Wodak²² has reported favourable results from large doses of arsenic. This is administered by the mouth in the form of Sodium Arsenate from $\frac{1}{2}$ to $\frac{3}{4}$ gr. daily in pill form. When tolerated, the treatment is kept up until 3 to 5 gr. have been taken, after which several months' rest is allowed.

DEAFNESS.

Re-education Treatment.—The detail of this method of treatment, with favourable results reported by Cathcart, was dealt with somewhat fully in the MEDICAL ANNUAL for 1926, p. 136. In conclusion, it was then stated that the treatment should be regarded as being on trial. Macleod Yearsley²³ states that, although originally a sceptic, after a trial of the method he has become converted. He points out that the treatment should not be regarded as miraculous, and should not be employed in cases in which the hearing has been irreparably destroyed. In successful cases the results are inversely as the age of the patient and the duration of the disease. Unless there is some improvement by the close of the first fifteen sittings, it is useless to continue. He has employed the method in 30 cases, of which 28 showed useful improvement. The nature of the lesion causing the deafness seems to be of little or no importance in deciding whether the treatment will be successful or not.

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Jour. and Record, 1927, June 1, 721; ⁸*Jour. Laryngol. and Otol.* 1926, Oct., 647; ⁹*Brit. Med. Jour.* 1926, Dec. 15; ¹⁰*Ibid.* Oct. 9; ¹¹*Ibid.* Nov. 20, 938; ¹²*Jour. Laryngol. and Otol.* 1926, Aug., 499; ¹³*Arch. Internat. de Laryngol.* 1926, July; ¹⁴*Jour. Laryngol. and Otol.* 1926, Dec., 785; ¹⁵*Zeits. f. Hals. etc.*, Band 12, Heft 1; ¹⁶*Arch. of Oto-Laryngol.* ¹⁷*Jour. Laryngol. and Otol.* 1926, Nov., 732; ¹⁸*Ibid.* 1927, Feb., 96; ¹⁹*Ibid.* 1926, Oct., 698; ²⁰*Laryngoscope*, 1926, Aug., 545; ²¹*Ibid.* Nov., 779; ²²*Deut. med. Woch.* 1926, March, 526; ²³*Practitioner*, 1926, Nov., 292.

EAR, FOREIGN BODIES IN.

A. J. M. Wright, M.B., F.R.C.S.

Foreign bodies in the ear are most frequently introduced by the patient during childhood. They may consist of anything which is small enough to be inserted into the meatus, and the first and most fundamental principle to be realized is that the foreign body, of itself, will do little if any harm, while, on the other hand, injudicious attempts at removal may do untold damage. There are many cases recorded in which foreign bodies have remained in the meatus for many years without producing any symptoms. Thus, in one case, a glass bead was known to have been in the meatus for thirty years, and in this case not even the hearing was in any way altered. The obtaining of a history that a foreign body has been introduced into the ear does not, by any means, make it certain that one is present, and therefore the first stage with such a patient should always be a thorough examination, with an efficient light, and if necessary, in the case of a refractory child, under an anæsthetic. Attempts at removal of a foreign body under unsuitable conditions may result in forcing it more deeply into the meatus, either up against the membrane or actually into the middle ear. The narrowest part of the meatus is at the junction of the cartilaginous and bony portions, and as a rule, unless interfered with, the object has not passed deeper than this. One other variety of foreign body needs mention—the insect. These may sometimes crawl into the meatus, usually during sleep. Most intense subjective symptoms are produced, consisting of an almost unbearable noise and discomfort, owing to the movements of the intruder. One interesting case of this type has been recorded in which the corpse of a wasp, embalmed in wax, was syringed from the ear of a farmer. From the history, it seemed probable that the wasp had entered some thirty years before.

TREATMENT.—This depends somewhat on the nature of the object. If not tightly impacted, syringing with warm water will often be effective. For the syringe to be successful, it is essential that there should be a crevice existing between the foreign body and the meatal wall, and the jet of fluid should be directed into this crevice, as it is the return current which is effective. Syringing has the disadvantage, in the case of such objects as a pea or bean, that if it is not successful it causes them to swell. This difficulty can be got over by subsequently filling the meatus with alcohol. If syringing is unsuccessful, an instrument must be employed under an anæsthetic, and in the vast majority of cases some form of hook or curette is to be preferred to any form of forceps. The latter tends to push the foreign body further in. If a few millimetres of the end of a fine probe be bent at a right angle, the hook thus formed can usually be passed between the foreign body and the meatal wall and the former easily drawn out. In some cases in which this may not be found possible, removal can be effected by dipping a small brush in dental cement, which sets very quickly, and holding it against the foreign body. In a short time the brush becomes firmly adherent and the object can be withdrawn. Occasionally, usually as the result of efforts at removal, it will be necessary to turn the auricle and cartilaginous meatus forwards after having made an incision behind it. This applies particularly to cases in which the foreign body has been driven into the middle ear.

ECZEMA.*A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.*

This subject was discussed at the annual meeting of the British Medical Association in 1926. A. Whitfield,¹ who opened, pointed out that it was possible to define eczema purely from the etiological standpoint, but that this would assume that it was a specific disease in the same sense that tuberculosis and syphilis were diseases. Secondly, it was possible to consider it from the anatomical standpoint, and in this connection he believed that, though the lesions appeared at first sight to be multiform, yet on careful examination an initial lesion of characteristic type could always be discovered. The earliest lesion was a congestion of the capillary loop in the head of a single papilla, followed by exudation of lymph from this vessel; this works its way through the epidermis, gradually forming a vesicle in the middle of the stratum mucosum. The lesion is microscopically and culturally non-bacterial. Thirdly, eczema may be considered from the physiological standpoint, and in this connection he calls attention to two facts. The first is that some skins possess a special susceptibility to one irritant so that they react to very small doses, or a general susceptibility where the reaction is present to many such bodies; the second, that some skins possess an idiosyncrasy, so that they react to minute doses of bodies which to most skins could not be classed as irritants at all. On these considerations he proposes the following definition for eczema: "Eczema is an eruption consisting of oedematous papules and vesicles arising in the deeper part of the epidermis and caused by an abnormal susceptibility, congenital or acquired, to the action of external irritants." He goes on to discuss the difficulties which have arisen in determining the mechanism of dissemination of eczema. He thinks we may conceive that there is one type of toxin which acts on the deeper vessels and nerves of the corium in such a way that the slightest rubbing or pressure determines the development of an urticarial wheal, whereas another type so affects the epidermo-papillary system that by the same kind of local stimulus an eczematous reaction is produced. He considers, if this explanation is accepted, that it may explain those cases of eczema which are apparently associated with mental anxiety or shock, gastro-intestinal disturbances, and focal sepsis.

J. V. Klauder and H. Brown² have made experimental studies of the calcium, magnesium, sodium, and potassium content of the skin of rabbits under normal conditions, after various diets, and after experimentally-induced states. The cutaneous irritability was first determined by noting the degree of reaction to croton oil. Cutaneous irritability varied considerably under normal conditions. In the chemical analysis of the skin it was observed that the amount of each base, as well as the total base, varied considerably. The variation was greatest with magnesium and least with calcium. The degree of irritability appeared to vary indirectly with the calcium and directly with the potassium content.

They consider that eczema may be regarded as a pathological process in which the cutaneous neurocellular mechanism is out of equilibrium, and they discuss the biochemical changes which alter the neurocellular mechanism. From the result of their studies they conclude that the maintenance of this equilibrium is intimately concerned with the vegetative nervous system, and, in relation to the latter, the endocrine glands, and can apparently be influenced through altered metabolism of divers origin.

REFERENCES.—¹*Brit. Med. Jour.* 1926, ii. 332; ²*Arch. of Dermatol. and Syph.* 1927, Jan., 1.

ELECTROCARDIOGRAPHY.
(See ELECTROCARDIOGRAPHY.)

(See ARRHYTHMIA AND CARDIOGRAPHIC

ENCEPHALITIS, EPIDEMIC.

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

Epidemic encephalitis is a general infectious disease, first described in 1917 in Vienna, by von Economo. Early in 1918 the disease became recognized in England; first by Hall, of Sheffield. Since then it has become a well-recognized clinical entity. In 1919 the disease was made notifiable in the United Kingdom. Its prevalence in England and Wales for the past seven years is shown in the following table of cases :—

1919	1920	1921	1922	1923	1924	1925
541	890	1470	454	1025	5039	2635

During 1924 there was a severe outbreak of the disease in Sheffield which formed the subject of special investigation by a committee of the British Medical Association under the chairmanship of Professor A. J. Hall. The report of this committee has been published by the Medical Research Council,¹ and comprises epidemiological, pathological, and clinical studies, together with a summary of recent researches into the etiology of the disease.

In the *epidemiological* section of this report attention is drawn to the impossibility of obtaining records of mild and abortive cases of the disease. It is therefore pointed out, as MacNalty had previously done, that statistical estimates of the incidence and fatality of epidemic encephalitis should be accepted with reservation, owing to the occurrence of unrecognized cases of this type. In view of the negative evidence as to lack of spread in the elementary schools, there is no good evidence that the disease is spread by direct contact, nor any data for computing an incubation-period if infection does take place. It is possible, however, that the infectivity of epidemic encephalitis is in accord with those of its sister diseases, cerebrospinal fever and poliomyelitis, in which the chain of infectivity from case to case is maintained by unrecognized mild and abortive cases and by healthy 'carriers'. On this assumption the unrecognized cases form links in the chain of infectivity from patient to patient.

PATHOLOGY AND MORBID ANATOMY.

Pathological laboratory studies by J. S. C. Douglas² have, so far, failed to give positive results of decisive value. In spite of numerous experiments, Douglas was unable to transmit the virus of the disease or its toxins to rabbits or mice, whether using cerebrospinal fluid from patients with the disease, emulsions of the brains of cases dead of the disease, or filtrates of cultures of washings of the nasal passages. The proper experimental study of the disease has therefore hardly begun. Critical examination of human subjects dead of the disease, and the study of cerebrospinal fluid collected during life, have proved that the Sheffield epidemic had the same pathological characters as other epidemics of encephalitis in this and other countries. Parallel work done in London by Perdrau is recorded in an appendix to the Sheffield report. This supports the contention of Levaditi and others that the causal agent of epidemic encephalitis is identical with that of *herpes febrilis*, except in regard to the greater affinity of the former for the central nervous system. It should be observed, however, as Perdrau himself notes, that the theory of the herpetic origin of epidemic encephalitis has not been accepted universally by research workers elsewhere. Thus J. E. McCartney,³ of the Metropolitan Asylums Board research service, points out that herpes is a mild disease and very common, whereas encephalitis is a serious and sometimes fatal disease which, if not fatal, produces severe damage to the central nervous

system with marked after-effects. There is thus no close similarity between febrile herpes and encephalitis, either from the clinical or epidemiological standpoint. Accordingly it is difficult to accept Levaditi's view that herpes is an attenuated form and encephalitis a virulent form of the same virus, for herpes is easily transmitted to animals, and yet encephalitis, although supposed to be the more virulent, is not. McCartney maintains that the etiological excitant of epidemic encephalitis has not yet been transmitted to experimental animals, that we have no information yet as to its nature, and that the so-called encephalitis virus, of Levaditi and Doerr, is probably a herpes infection that has been picked up accidentally and transferred to rabbits.

The *morbid anatomy* of acute epidemic encephalitis is now well known. The appearances are well described in a paper by J. G. Greenfield.⁴ With the naked eye the most striking and sometimes the only obvious change in the nervous system is a diffuse congestion of the grey matter of the brain, to which the term 'plum-coloured' has been aptly applied. This congestion affects not only the cortex but also the basal ganglia and brain-stem. Although it is most conspicuous in the vascular grey matter, it affects the white matter as well. In addition there are often capillary hæmorrhages, commonest on the cortex, but also under the ependyma of the third ventricle, of the Sylvian iter, or of the fourth ventricle. Microscopically the vascular changes are the most obvious, consisting of intense congestion with perivascular infiltration by mononuclear and plasma cells. Polynuclear infiltration never occurs. Meanwhile the nerve-cells in the affected areas degenerate and disappear. Greenfield thinks that the perivascular infiltrations represent iron which has been set loose by the degeneration of the neurones, and that they are evidence of neuronal decay rather than of vascular disease. In the later or post-encephalitic cases, the inflammatory changes of the early stages are slight or absent. Slight perivascular cuffing of vessels and small infectious nodules may be found in the most affected regions and have been accepted as evidence that the virus, probably in a less virulent form, is still present in the tissues of the brain. But the most striking changes are those of neuronal decay. Accurate cell counts have shown that a considerable proportion of the nerve-cells in many regions of the brain have disappeared. In Parkinsonian cases the brunt of the attack falls on the substantia nigra of the crus cerebri, and in the confusional insanities on the cortex and centrum ovale, but any region of the brain may be affected.

With regard to the *clinical pathology*, the blood may show a slight leucocytosis, from 10,000 to 20,000 per c.mm., but there is nothing characteristic either in the degree or in the nature of this. An excess of blood-sugar is common, as in many fevers, but this usually subsides after the acute stage of the illness is over. The cerebrospinal fluid presents fairly characteristic changes. Its pressure is usually raised to between 200 and 300 mm. During the first two or three weeks there is usually an excess of cells, all or almost all mononuclears, varying from 10 to 200 or more per c.mm. But in quite a large proportion, up to 50 per cent of some published records, lymphocytosis has been absent. In contrast to the lymphocytosis, the albumin and globulin show only a slight excess, and it is not unusual to find a considerable pleocytosis without protein excess, the so-called protein dissociation. In the hæmorrhagic cases the fluid may be yellow and contain an admixture of red cells. The glucose content is usually above the normal. The colloidal gold reaction in a large proportion of cases is of a weak luetic or meningitic type, and occasionally a strong luetic or even a paretic curve is obtained.

The foregoing pathological changes would indicate that the disease is a general blood-borne infection showing a particular affinity for the brain, though

it does not exclude the possibility of infection via neural lymphatics, e.g., via the optic, oculomotor, or trigeminal nerves. In any case, whether entering by way of the blood-vessels or the lymphatics, the virus gains access to the nervous parenchyma, leading to neuronal degeneration with overgrowth of neuroglia. There is both clinical and histological evidence that in some cases the virus in a less virulent form may linger on in the tissues of the brain for months or even years, causing progressive neural destruction with increasing symptoms of nervous disability. In most cases, however, it seems that the virus dies out completely after the first few weeks, leaving behind it permanent damage of a greater or lesser degree. The chief value of examination of the cerebrospinal fluid is to enable us to exclude meningitis, whether tuberculous or syphilitic, the condition which is most likely to be confused diagnostically with epidemic encephalitis.

CLINICAL PHENOMENA.

In the Sheffield epidemic 301 undoubted cases of encephalitis were subjected to careful analysis, excluding 16 other suspected cases which proved to be something other than encephalitis. From this large material,⁵ subjected to the same high standard of clinical examination, many points of interest emerge. The symptoms and signs have been tabulated into those of the primary attack and those of residua or sequelæ.

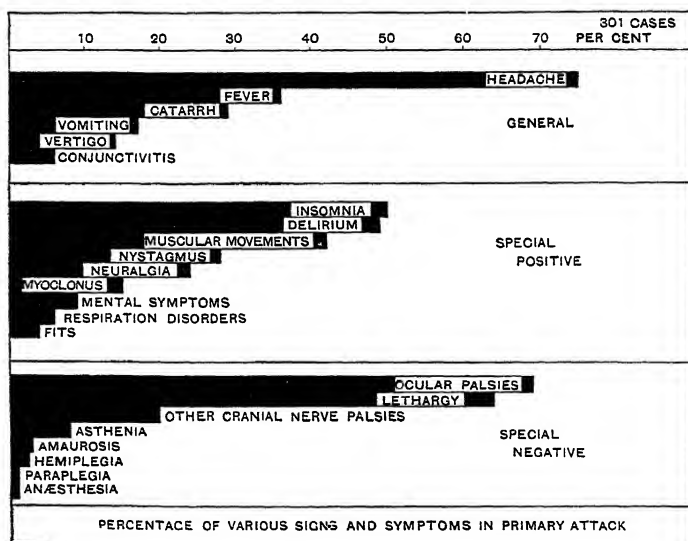


Fig. 15.—The Sheffield outbreak of epidemic encephalitis. (Figs. 15–19 reproduced by kind permission from the Medical Research Council Special Report No. 108.)

THE PRIMARY ATTACK.—The symptoms in the primary attack have been further subdivided into general and special symptoms. The *general symptoms* include fever, pains in the head or general aching of the limbs, vertigo, vomiting, conjunctivitis, and catarrhal symptoms such as sore throat, laryngeal or nasal catarrh. The *special symptoms* are divided into positive and negative. The *positive symptoms* are insomnia, delirium, maniacal symptoms, abnormal

muscular movements, fits, myoclonus, disorders of respiration (polypnoea, etc.), nystagmus, and severe neuralgic pains, other than in the head. (For purposes of calculations, myoclonus was included in the abnormal muscular movements. The reason for the special sub-heading of myoclonus was in order to ascertain the frequency of abdominal myoclonus.) The *negative symptoms* include lethargy, ocular palsies, palsies of other cranial nerves, hemiplegia, paraplegia, asthenia, amaurosis, and anaesthesia. Finally, there was a third group of symptoms which did not fit either into the positive or negative phases. This group included cases of *Parkinsonism*, also katatonic, tabetic, and ataxic cases. The preceding chart (Fig. 15) shows the percentage of each of the various signs and symptoms recorded in the primary attacks, arranged according to the scheme described above. From this it is seen that, amongst the general symptoms, headache is by far the commonest. Amongst the special symptoms, sleep disorders of various kinds, ocular palsies, and various positive motor phenomena predominate. These facts confirm what has been known since the disease first appeared.

Another point to which the Committee directed special inquiry was the question of *prognosis*. The conditions in Sheffield were well suited for 'follow-

ing-up', and in every one of their 301 cases information has been gathered as to the primary attack, the subsequent progress, and the general condition after 12 to 18 months. In this way the Committee has tried to ascertain whether the primary attack, either by its degree of severity, or by the presence of any individual symptom or symptoms, has a more or less unfavourable outlook as regards life or permanent damage; whether there are any particular signs or symptoms which may be confidently looked upon as of favourable omen; whether any particular symptom in the primary attack is likely to be permanent, or to disappear;

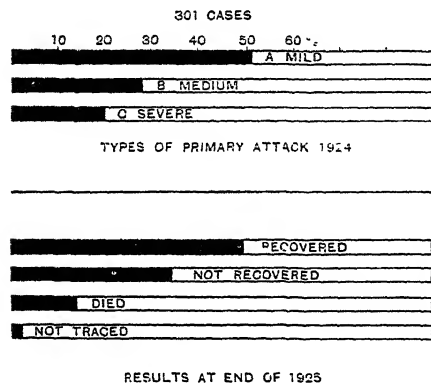


Fig. 16.—Types of primary attack and general results in all cases, shown as percentages.

what is the general economic damage caused by a wave of encephalitis in the community which it attacks; whether any particular age in either sex is specially susceptible to a more severe attack, or to a particular form of attack, or to the occurrence of general or special residua. To these questions the Committee offer replies of great interest and importance.

As regards the severity of the primary attack, three types are described; mild, medium, and severe (Fig. 16). In 51 per cent of the cases notified the primary attack was mild, being correctly diagnosed by the presence of general symptoms, together with localizing or indicator symptoms, such as insomnia, delirium, disorderly breathing, attacks of polypnoea, sudden vertigo or diplopia, painful abdominal myoclonus, and so on. In 20 per cent of cases the type of the primary attack was severe. In a considerable number of these the positive motor phenomena dominated everything else. After an acute onset with cerebral excitement, insomnia, and noisiness, violent choreiform movements appear and may within a few hours lead to extensive excoriations

of the skin of the trunk or limbs. The choreiform movements may be accompanied by myoclonic contractions in various parts. These violent positive motor phenomena do not last for many days, but are followed by the phase of lethargy, in which they become much less marked. The myoclonus, however, may continue for weeks or even months. In the cases which prove fatal

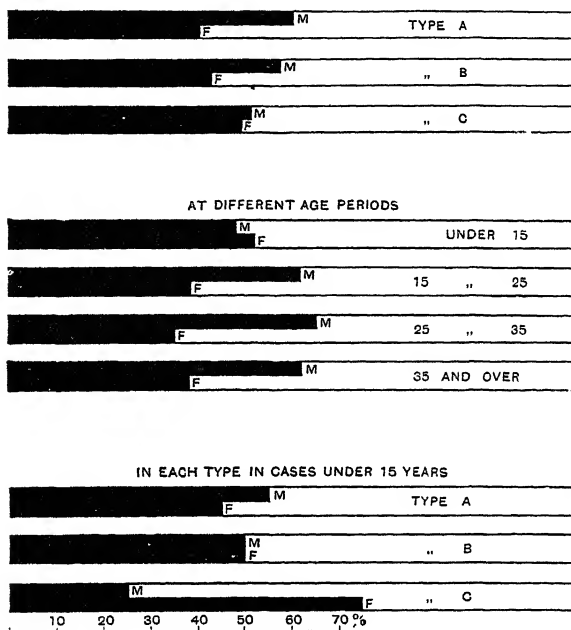


Fig. 17.—Sex distribution in primary attack of each type at all ages; in all types at different age periods. in each type in cases under 15 years; shown as percentage.

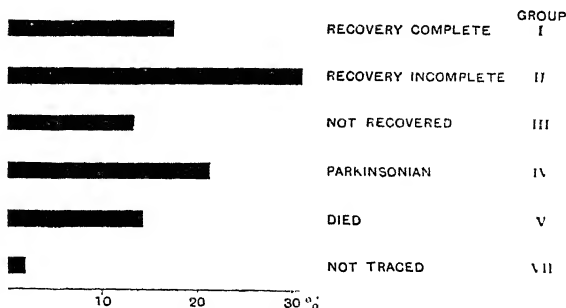


Fig. 18.—Groups of results in all cases

during the acute attack the positive symptoms usually change to negative. Lethargy, stupor, gradually increasing coma, profuse sweating, and rising temperature precede the end. The severe cases with fulminant onset may end fatally within a few days or a week or two.

As regards sex distribution, the total proportion of males was 58.4 per cent. The relative proportion of males to females was found to be greatest in the mild primary attacks, and to diminish as these became more severe. This was found to be due to the preponderance of severe attacks in girls under 15 years of age (*Fig. 17*).

On the whole, the milder types of primary attack produced the greater number of cases of complete recovery; the more severe attacks the cases of non-recovery and death (*Fig. 18*). One exception to this occurs, in the cases of Parkinsonism. This residual malady not infrequently follows an encephalitic attack of extreme mildness.

The prognosis as regards death in the primary attack is also discussed. It

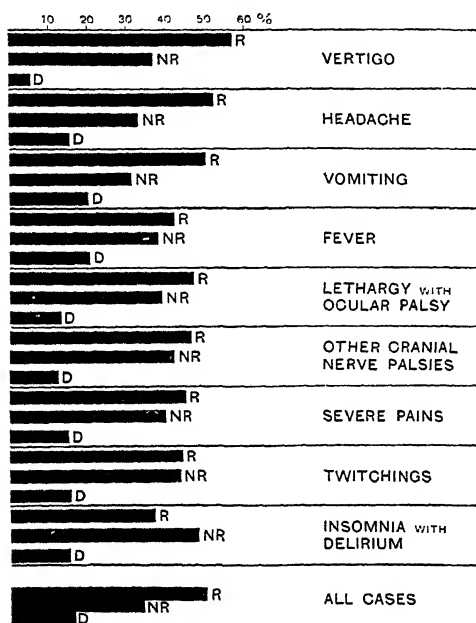


Fig. 19 —Results in cases having various symptoms in primary attack. R, Recovery; NR, Non-recovery; D, Death.

was found that, amongst the general symptoms, the death-rate was somewhat above the average in cases where there was definite fever, and in cases with vomiting. It was lowest in cases complaining of vertigo (*Fig. 19*). Amongst the special symptoms, the death-rate was highest in cases with acute disturbances of the respiratory mechanism, particularly polypnoea. It was also above the average in cases with acute mental symptoms, and slightly so in cases of disorders of sleep not accompanied by ocular palsy.

The prognosis as regards persistence of symptoms occurring in the primary attack is also of importance. It has long been realized that ocular palsies rarely persist. Various minor ocular changes may persist, but they are mostly slight (e.g., inequality of pupils with definite reaction of one type or another)

and cause but little inconvenience. Vertigo tended to disappear when present in the primary attack. Severe neuralgic pains only persisted in one-sixth of the cases in which they occurred. The cases with abdominal myoclonus as the chief symptom recovered with remarkable uniformity.

Mental disorders persisted in a modified way in half the cases in which they were acute in the primary attack. On the other hand, more cases are recorded as having mental residua at the end of 1925 than the few in which they had persisted from the start.

Sleep disorders have been recognized as tending to persist for long periods. Analysis of the records shows that: (1) On the whole, whichever form of sleep disorder was present in the primary attack, this was more likely to be the form in which it persisted, if it did at all. (2) The factor of persistence was most common in the cases with insomnia alone in the primary attack.

(3) Sleep disorder may first appear as a sequela, and in about three-quarters of such cases it takes the form of nocturnal insomnia.

RESIDUA AND SEQUELE.—Amongst the most striking residua of epidemic encephalitis is the change which it produces in *moral character*. This is most marked in children and adolescents, whose moral make-up is incompletely set, but it is by no means limited to them. Older patients, although they do not usually show it in such a difficult way, are frequently much altered by an attack. Thus a man of 56, previously a kindly and affectionate husband, now spends all his time trying to annoy and irritate the members of his household. Another case, a woman of 49, has changed from a generous and cheerful woman to a stingy and silent one. These mental changes, however, are seen at their worst in post-encephalitic children. A large proportion of children attacked become altered to some extent. It is not easy to separate the moral changes from the mental. Mental deterioration occurs frequently as a residuum, and is not uncommonly associated with moral changes. In a certain proportion of the children in hospital during the primary attack, such moral changes were seen even during the primary attack, but as a rule they were not clearly noticed until they resumed ordinary life, after the primary attack was over. Some of these are of the type known as 'difficult children', quarrelsome, disobedient, and untruthful, but not vicious. Others, rather more common, are of the so-called 'apache' type—mischievous, violent, thieving, and lying. Such cases are extremely difficult to deal with. The State has no machinery at its disposal at the present time exactly fitted for their requirements. Punishment under the common law is obviously unfair; they are not really mentally defective within the definition of the act. In Poor-law or other institutions they become intolerable nuisances; home life is in many instances the worst thing possible for them; the mental hospital ensures protection for themselves and for the community, but alone it does little to promote their recovery.

As regards *mental changes*, few patients after an acute attack of epidemic encephalitis are mentally quite the same as they were before, and yet the total number of cases recorded with persistent marked mental changes at the end of eighteen months was comparatively small. A few are severely melancholic and even suicidal. Most of them are simply less bright and active, more irritable, deficient in concentration and memory, and so on. In adults the effects are similar, and show themselves most in those whose work involves mental effort. Such persons find great difficulty in keeping up to the requirements of their posts, and readily break down in the attempt.

Disorders of sleep have been a prominent feature in the early stages of epidemic encephalitis ever since it made its first appearance; indeed, the tendency to increase of sleep was so striking as to give rise to the name by which it was originally known. Further experience has shown that the disorder of sleep may also occur with equal severity in the opposite direction, viz., that of insomnia, which is almost as common and quite as characteristic a symptom of encephalitis as is lethargy. In many cases, in the primary attack, the two alternate with one another, so that a period of intense sleeplessness, lasting for some days, may be followed by an even more prolonged lethargy of a profound kind. Nearly 84 per cent of the cases are reported as having had some disorder in their primary attack. Sleep disorders as a residuum of the disease may occur both in children and in adults. A common type is the well-known reversal of the normal sleep-rhythm. These patients can, and do, sleep long and deeply each twenty-four hours, but the periodicity of the rhythm has changed, so that they begin to sleep at the time they ought to be getting up, and may continue to sleep heavily until a time corresponding to the hours they would have slept in an ordinary good night. Then comes

the phase of nocturnal restlessness, beginning when the rest of the family is going to bed.

Respiratory disorders in the primary attack were of serious prognosis, but did not persist in any of the cases, so that disorders of the respiratory mechanism as a sequela had in no case been preceded by respiratory disorder in the primary attack. The form of respiratory disorder as a sequela may be very varied, e.g., attacks of polypnoea with noisy blowing and marked deep expirations. Associated with this there may be various superadded noises—snorting, grunting, sniffing, etc. These attacks are not infrequently associated with insomnia, and the breathing disorders are worst at night. They sometimes precede the onset of Parkinsonism, and are not uncommon in the cases of moral changes in young boys. Respiratory sequelæ were more often seen in males than females (4 to 1), and the average age of the patients was about 15 years. This is in marked contrast with respiratory disorders in the primary attack, which were found more often in females than males (8 to 6) and in older persons, the average age being 28.

Post-encephalitic Parkinsonism was considerably more common in males than in females (46 to 18). The age period is a striking one. Out of the 64 cases, 44 were between the ages of 15 and 35. This is particularly noteworthy, seeing that the classic paralysis agitans has hitherto been known as essentially a disease of declining years.

The time of onset of Parkinsonism after the primary attack is difficult to estimate, but it seemed to be most commonly from six to twelve months. There was no evidence that early cases of Parkinsonism have a better prognosis than those occurring later. As regards early distribution of Parkinsonian symptoms, the characteristic facial mask was most frequently present and usually the earliest symptom to be observed. Next to this in frequency was involvement of the upper limb—slowness and stiffness in ordinary actions, loss of the normal swing in walking, an interosseal position of the hand, and semi-flexion of the elbow. Tremor may be absent for a long period—even years—after the hypertonus has developed, but ultimately it tends to appear also. Both sides are commonly affected. When unilateral, the right and left sides are about equally affected. In a certain number of cases of Parkinsonism there is rapid gain of weight; in others, marked loss. T. G. Walsh⁶ has independently recorded four cases of rapid post-encephalitic obesity in children. In a few cases polyuria persisting for long periods has been seen. Five out of the 64 cases of Parkinsonism have already died; of the remainder, a considerable proportion of cases are known to be getting steadily worse, whilst about half seem to be at a standstill.

Dribbling of saliva is sometimes an early symptom in encephalitis, and may clear up without developing Parkinsonism later. More commonly it is one of the earlier symptoms of Parkinsonism.

Curious tonic spasms of the ocular muscles are occasionally met with in post-encephalitic Parkinsonism. They usually take the form of recurrent oculo-gyre attacks in which the eyes are involuntarily turned upwards, usually somewhat to one or other side, remaining fixed in that position for a variable time, perhaps several minutes. During this time the patient finds himself unable to do anything until the spasm relaxes. A somewhat similar spasm is sometimes met with in the masticatory muscles in post-encephalitic Parkinsonian cases, so that at meals they cannot for a time open their mouths to take in food until the spasm has passed off, which may not be for some minutes. They can then go on eating comfortably. These attacks, like the ocular ones, come on without obvious cause at irregular times.

The mental condition of these Parkinsonian cases varies widely in different

instances. In some there is extreme depression, even amounting to suicidal tendencies; at the opposite extreme are cases of sanguine optimism and facile emotionalism. In many cases the mental condition is one of apathy, although it is often difficult to assess the real mental condition owing to the expressionless facial mask. Occasionally the apache type of mental disorder in childhood is associated with Parkinsonism.

TREATMENT.

In this country no specific remedy is yet available for this malady. W. Heinicke,⁷ however, of Chemnitz-Altendorf, claims to have secured encouraging results, both in acute and chronic cases of epidemic encephalitis, by the intravenous injection of Serum from a Convalescent Case of the disease. The dose for the adult is 50 to 60 c.c., repeated on several successive days. The more recent the antecedent attack of encephalitis in the donor, the more favourable are the results in the recipient. One must, of course, ascertain beforehand that the donor is free from tuberculous or syphilitic infection. The serum from the convalescent patient is preserved in glass ampullæ, and mixed with some antiseptic such as yatren. One convalescent patient, he states, can provide enough serum, by repeated venepunctures, to serve for the treatment of two fresh cases of the disease. These two cases in turn can provide serum for four further cases, the four cases for eight, and so on. This procedure is actually carried out now at Chemnitz, the convalescent serum donor being given a financial reward for his services. Heinicke relates no clinical cases from his own personal experience, but quotes Stern, of Göttingen, as having carried out this treatment.

In the absence of a specific serum treatment, we have to content ourselves with other remedies to arrest the infective malady. Of these, mention may be made of Electrargol, Trypaflavin, and Sodium Salicylate, all of them by intravenous injection. Sodium salicylate can be made up in 15 per cent solution, of which 10 to 15 c.c. are injected to begin with, subsequently increased to 20 c.c., i.e., a dose of 3 grm. of the salt.

Chronic cases are singularly resistant to medicinal remedies, with the exception of hyosine and belladonna, to which we shall refer presently. H. Marcus, C. Kling, and G. Högglund⁸ have inoculated patients suffering from chronic epidemic encephalitis with an Emulsion prepared from *Spirochæta Duttoni*, the organism of relapsing fever. One to two c.c. of the emulsion were injected intramuscularly. This induced a paroxysm of relapsing fever two or three days later, succeeded by three to five further bouts. The recurrent fever disappeared spontaneously. Eleven out of 18 patients thus treated were suffering from severe chronic post-encephalitic phenomena of from three to six years' standing; 13 of the patients were kept under observation for from one to three and a half months after inoculation; in 12 of them there was marked improvement, which was maintained, and in some was even progressing.

P. K. McCowan and J. S. Harris⁹ think that Hyosine may be regarded as a specific in the treatment of post-encephalitic Parkinsonism. They have investigated the blood-sugar curve, the muscular tonus, the psycho-galvanic reflexes, all of them abnormal in these patients, and find that these abnormalities can be partially corrected by hyosine. In a normal person a hypodermic dose of $\frac{1}{160}$ gr. of hyosine hydrobromide is followed, in ten or fifteen minutes, by dryness of the mouth and throat, giddiness and unsteadiness of gait, slight mental confusion, and dysarthria; accommodation is also temporarily impaired, so that none but the largest print can be read. Later, the individual feels fatigued and, if left alone, falls asleep for several hours. It is therefore obvious that to the normal individual the effects of hyosine are

depressant. The reverse is the case in chronic encephalitis: the general muscular rigidity is diminished, tremors of the face and limbs are alleviated, whilst the excessive lachrymation is diminished; meanwhile the patient becomes mentally more alert. Another effect of $\frac{1}{100}$ gr. of hyoscine is to cause a temporary hypoglycæmia. Sometimes therefore the patient is given a dose of glucose at the same time. Their best results have been obtained by a combination of oral and hypodermic medication, $\frac{1}{100}$ gr. being given hypodermically in the morning and $\frac{1}{100}$ gr. by the mouth during the day. Some of the unpleasant effects of the hyoscine are combated by giving $\frac{1}{100}$ gr. of pilocarpine. Some of their patients have been on hyoscine treatment for two years without deleterious effects. The action of the drug, however, is only temporary, and when it is discontinued the symptoms promptly relapse. They also claim good results from the use of **Tryparsamide**, given in eight weekly injections of 2 to 3 gr. None of their cases is said to have shown progress of the disease since tryparsamide was given.

Many other clinicians, including Hall, of Sheffield, and myself, find that a useful palliative treatment is by means of **Tinet. Belladonnæ**, pushed in full doses. It is astonishing how tolerant post-encephalitic Parkinsonian cases are to this drug. A convenient way to prescribe it is to begin with 10 drops of the tincture in a wineglassful of water twice a day, increasing this dose by 1 drop every other day until the patient is taking 20, 25, or even 30 drops twice daily. A careful watch must be kept on the pulse-rate during this treatment, but it is remarkable how well such patients usually stand the drug.

REFERENCES.—¹*Med. Research Council Special Rep. Series No. 108*; ²*Ibid.*, ³*Jour. of State Med.* 1926, Dec. 709; ⁴*Ibid.* 697; ⁵*Med. Research Council Rep.*; ⁶*Jour. Amer. Med. Assoc.* 1926, July 31, 305; ⁷*Munch. med. Woch.* 1926, Oct. 1, 1647; ⁸*Comptes rend. Soc. de Biol.* 1926, Sept. 21, 527-828 (Partial Index); ⁹*Lancet*, 1926, II, 1220.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—According to the Annual Report of the Chief Medical Officer of the Ministry of Health,¹ the number of cases notified during 1926 (2635) was 368 short of those notified in 1925 and about half of those recorded in the maximum year 1924 (5039). It would, however, be premature to regard this as indicating a continued decline in the incidence of the disease. The diminution may also be partly explained by some difficult borderline cases having been regarded by medical practitioners as poliomyelitis or polio-encephalitis. During 1926, 1270 deaths were attributed to encephalitis, so that the ratio of registered deaths to notified cases for the year was 56 per cent.

M. Tsurumi² describes an outbreak of epidemic encephalitis in Japan which occurred in August, 1924, and increased so rapidly that by the end of September there were 6547 cases with a mortality of 54.9 per cent. More than 80 per cent of the patients were of ages from 50 to 70. The sexes were equally affected. A remarkable feature of the epidemic was the absence of ocular symptoms, although somnolence and spasmodic movements were well marked. In cases which recovered there were usually no serious sequelæ apart from rigidity of the arms and legs.

SYMPTOMS AND COMPLICATIONS.—A unit for the residential treatment of children between 3 and 16 years of age suffering from the After-effects of encephalitis lethargica was opened in November, 1925, at the Metropolitan Asylums Board's Northern Hospital at Winchmore Hill. G. A. Borthwick,³ the Medical Superintendent, describes the after-effects in 141 of the cases, of which 38 showed the Parkinsonian syndrome as the predominant type, 57 were delinquents, 30 showed nocturnal excitement, 3 respiratory changes, 6 hemiplegia, 2 diplegia, 4 pathological obesity, and 1 excitomotor phenomena (extra-pyramidal hyperkinesia). In some cases the acute attack which produced the

after-effects was neither severe nor even noticeable, and the interval between the acute attack and the sequelæ might be from two months to five years. In children, changes of morals and character were often the predominant features. Some showed marked irritability, querulousness, use of bad language, propensity to destructiveness, vagrancy, pilfering, precocious eroticism, obscene conduct, cruelty, and attempts at murder, while in others the emotional equilibrium became disturbed or their intellectual faculties impaired by lack of concentration, unreliable perception and retention of ideas, and a failing interest in their work. In others the sequelæ were a state of psychomotor excitation, with restlessness, insomnia, inversion of sleep rhythm, and a tendency to tics, such as smacking, spitting, scratching, blowing, tapping, blinking, and nail-biting.

Sir George Buchanan⁴ has drawn up a table showing that about a quarter of the patients who are not cured develop incurable *mental disorders*. The proportion is probably higher, because in some series cases of Parkinsonism are not included, although in the last stages the physical signs are often accompanied by mental symptoms. Moreover, in most cases minor mental disturbances are not taken into account. The mental sequelæ of lethargic encephalitis can be divided roughly into two principal groups: (1) positive or active sequelæ, (2) negative or passive sequelæ, both of which may be found in children, adolescents, or adults. Irritability and excitability associated with other signs of loss of inhibition explain the behaviour of young persons suffering from mental disturbance following epidemic encephalitis. As a rule this excessive irritability is not found in adults, but rather apathy, lethargy, and a general diminution of the mental and moral tone. Consciousness of their physical and mental breakdown leads to depression and occasionally acute melancholia. It is, however, remarkable to find how small a proportion of cases are admitted to asylums. It is unusual for the intelligence or mental faculties of a child to be sufficiently affected to bring him under the control of the Mental Deficiency Act. In older patients a considerable time may elapse before the development of a real psychosis which renders them notifiable. According to the Annual Report of the Board of Control for 1925, there were about 227 cases of encephalitis in asylums and 96 in the children's department of the mental deficiency institutions. Of the 227 cases, about 35 were under 16, and 60 between 16 and 21. The mental sequelæ are more likely as a rule to end in improvement or recovery in the case of children than in adults.

L. Lequint⁵ describes a special variety of epidemic encephalitis characterized by *vertigo*. The pure form is very rare, and as a rule ocular and other symptoms of encephalitis accompany the signs of vestibular involvement. The differential diagnosis of this form of encephalitis from other diseases of the internal ear and nervous system, especially disseminated sclerosis and nerve syphilis, may be very difficult. The prognosis even in the mildest cases should be guarded owing to the frequent persistence of ocular symptoms and signs of vestibular involvement, and the possible occurrence of Parkinsonism as in other forms of epidemic encephalitis. Abadie and Auriat⁶ report a unique case in a man, age 27, of epidemic encephalitis in which *choreic movements lasted three years*, and were progressively replaced by Parkinsonism. During a transitional period of two years he presented choreic movements on the right side and Parkinsonian rigidity and tremors on the left. G. Stiefler⁷ also reports a unique case of *periodic sleeping spells* following an acute attack of epidemic encephalitis. The patient, a carpenter, age 24, showed a certain rigidity of the muscles of expression and stiffness of the neck muscles characteristic of Parkinsonism; but apart from the periodic sleeping spells which occurred at intervals of weeks or months, and lasted from several days to a

week, there was no other nervous disturbance, and the patient was able to pursue his occupation. The sleeping spell, which was quite indistinguishable from ordinary sleep, did not set in suddenly, but required several hours for its full development. It was thus quite distinct from post-encephalitic narcolepsy, which develops suddenly, and in which there is no free interval. Epilepsy and hysteria could also be excluded.

P. Mériel,⁸ who reports a case of *Argyll Robertson pupil* in epidemic encephalitis in a man, age 23, in whom the Wassermann reaction in the blood and cerebrospinal fluid was negative, states that numerous writers have drawn attention to changes in the pupils in this disease, either in the form of paralysis of accommodation or complete rigidity of the pupils. Achard regards the Argyll Robertson pupil as very rare, but the reverse process of loss of accommodation and preservation of the light reflex is not infrequent. Krabbe (1925) appears to be the only other writer who has recorded a case of epidemic encephalitis in which the Argyll Robertson pupil was present apart from syphilis. J. S. Harris⁹ examined the *knee-jerk* in 18 patients suffering from mental symptoms associated with chronic epidemic encephalitis, and found that 13 gave a distinctly abnormal response. *Hyosine*, which had been found to produce marked temporary improvement in these cases (see MEDICAL ANNUAL, 1926, p. 142; 1927, p. 137), caused the abnormal reflexes to re-approximate to the normal, but had no action on abnormal knee-jerks in katatonic dementia præcox.

T. G. Walsh,¹⁰ who records four illustrative cases of *post-encephalitic obesity*, three of which were in females of ages 15, 16, and 22, and one in a boy, age 16, states that a rapid increase in weight is not uncommon among the sequelæ or chronic manifestations of epidemic encephalitis. Usually the obesity has a general distribution, but it may be of the pituitary type, involving chiefly the girdle region and the proximal parts of the extremities. Among other symptoms, which in the absence of pituitary tumour are suggestive of post-encephalitic obesity, are somnolence, narcolepsy, psychic changes, and a labile temperature with occasional febrile periods, rapid fluctuations in weight with a normal or raised metabolism, and association of neurological manifestations.

S. Schoenborn¹¹ discusses the question of the *identity of epidemic encephalitis and herpes*, and summarizes the arguments in favour of their identity as follows:

(1) The immunity of rabbits infected with the herpes virus to the virus of encephalitis; (2) The immunity of rabbits infected with the encephalitis virus to corneal and cutaneous infection with herpes; (3) The presence of the herpes virus in healthy persons in the environment of encephalitis patients; (4) The remarkable chronicity of many cases of epidemic encephalitis analogous to the recurrence of many cases of herpes simplex; (5) The possibility of a herpes virus not originally neurotropic becoming so after repeated transmission through animals (Gildemeister and Herzberg). On the other hand, the arguments against a connection between encephalitis and herpes are as follows: (1) Herpes is extremely rare in encephalitis; (2) Transmission of human encephalitis to animals is difficult—Flexner was successful in only one out of 27 attempts; (3) The prevalence of the virus of herpes simplex does not cause an obvious spread of encephalitis even in epidemic times; (4) It is practically only small animals such as rabbits and guinea-pigs that are susceptible to herpes encephalitis, and not large animals more closely related to man; (5) Paralysis which are rare in epidemic encephalitis are often the prominent feature in the herpes encephalitis of rabbits and guinea-pigs; (6) Spontaneous encephalitis in small animals is a frequent occurrence. Schoenborn concludes that herpes encephalitis in animals and human encephalitis are not identical. There is no clinical evidence in support of such identity, and the experimental data in its favour

can be explained by the fact that latent infection with herpes virus is extremely common in human beings.

TREATMENT.—R. Fawcitt¹² reports 9 cases of epidemic encephalitis with Parkinsonism in patients from 14 to 60 who derived considerable benefit from **Ultra-violet Rays**, especially as regards improvement in gait, feeling of well-being, diminution of salivation, and relaxation of the fixed expression of the face. The multiple arc lamp was applied in the usual way back and front for gradually increasing periods up to half an hour twice weekly, and the mucosæ of the nose and tonsils were treated by the mercury-vapour lamp with adaptor for a period not exceeding two minutes for each area.

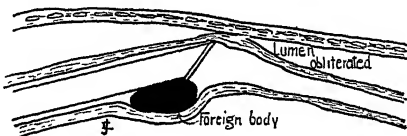
REFERENCES.—¹*Ann. Rep. Chief Med. Off. Min. of Health*, 1926, 67; ²*Bull. de l'Office Internat. d'Hyg. Publ.* 1927, 799; ³*M.A.B. Rep.* 1926-7, 148; ⁴*Bull. de l'Office Internat. d'Hyg. Publ.* 1927, 764; ⁵*Thèse de Paris*, 1926, No. 211; ⁶*Jour. de Méd. de Bordeaux*, 1927, 517; ⁷*Wien. klin. Woch.* 1927, 586; ⁸*Gaz. des Hôp.* 1926, 870; ⁹*Lancet*, 1927, 1, 968; ¹⁰*Jour. Amer. Med. Assoc.* 1926, lxxxvii, 305; ¹¹*Deut. med. Woch.* 1927, 870; ¹²*Brit. Med. Jour.* 1927, i, 422.

ENDOSCOPY.

A. J. M. Wright, M.B., F.R.C.S.

Chevalier Jackson¹ gives a review of some points in technique. He emphasizes the importance of extensive preliminary training of the hand and eye on the

Fig. 20.—Serious obstruction of trachea from crowding of the party wall during œsophagoscopy, especially in babies and very young infants. (Figs. 20, 21, 22, re-drawn from 'Surgery, Gynecology, and Obstetrics'—from advance sheets of 'Bronchoscopy and Œsophagoscopy', by Chevalier Jackson, 2nd ed., W. B. Saunders Co.)



dummy, the cadaver, and living animals, before proceeding to work on the human subject. In regard to contra-indications to endoscopy, the dyspnœa of asthma is no contra-indication. It is important to realize that the respiration may be obstructed in infants by œsophagoscopy as well as bronchoscopy, owing to the softness of the tissues. This can be understood from the diagram (Fig. 20), showing tracheal obstruction from the œsophagoscope and a foreign body *in situ*. General ill-health of the patient, while it calls for consideration as to the urgency of endoscopy, is, in itself, no absolute contra-

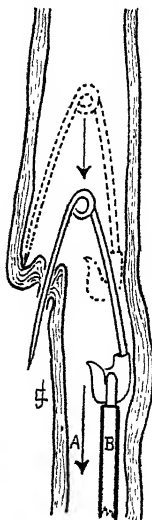


Fig. 21.—Schematic drawing of what will happen if the author's dictum, 'advancing points perforate, trailing points do not', is ignored. Injudicious traction by the forceps, B, in the direction of the dart, A, has drawn the pin upward from the position shown dotted, and has drawn the advancing point through the œsophageal wall.

indication. In Jackson's clinic, only one death is recorded out of over 4000 endoscopic examinations. In the removal of pointed foreign bodies, it is always important to remember the dictum that advancing points perforate, trailing points do not. Fig. 21 will explain this. A careful preliminary clinical examination of the patient and an X-ray examination are of the utmost importance. The stomach should be empty of food whether an anæsthetic is to be given or not, and measures should be taken to ensure that the mouth is clean. A preliminary examination of the larynx with the mirror is essential. The

most important single factor in successfully conducting a bronchoscopic examination is probably the position of the patient. The tendency of the inexperienced is to have the head too low and not in the correct position shown in *Fig. 22*, and this is apt to cause unnecessary difficulty and induce trauma. The head, of course, is supported in this position by an assistant.

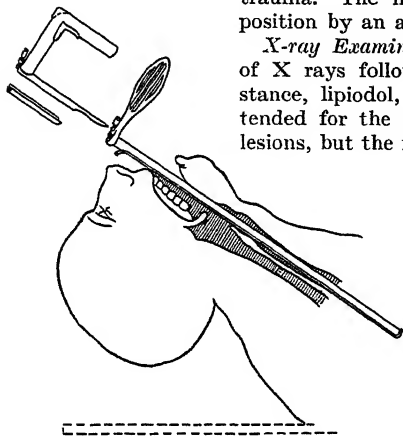


Fig. 22.—From a schema illustrating oral bronchoscopy. The portion of the table here shown under the head is, in actual work, dropped all the way down perpendicularly. It appears in the drawing as a dotted line to emphasize the fact that the head must be above the level of the table during the introduction of the bronchoscope into the trachea. This drawing shows the laryngoscope removed, leaving the bronchoscope alone in position.

X-ray Examination of the Bronchial Tree.—The use of X rays following the injection of an opaque substance, lipiodol, into the bronchial tree, is being extended for the diagnosis of bronchial and pulmonary lesions, but the method of introducing the lipiodol has

not yet become uniform. Stewart Pritchard² discusses the possible methods of introduction, which are injection through the glottis via the mouth, through the cricothyroid membrane, or through the bronchoscope. His method of choice is through the glottis. The position of the patient must be such as to allow the oil to gravitate towards the area to be explored, and the skiagram should be taken immediately, before the oil has time to move. No ill-results were noticed out of more than 600 cases. A negative result does not prove the absence of bronchiectatic dilatations, and the method should not be used in acute conditions or pulmonary tuberculosis.

Oscar Beck has also obtained good results by injection through the glottis. For this purpose, a semi-stiff catheter 2 mm. in diameter is introduced into the larynx and trachea, after a previous cocaineization. A silver wire stiffens the catheter, and it is protected from the patient's teeth by a vulcanite collar. The preliminary cocaineization must be sufficient to obviate the immediate rejection of the lipiodol by cough. (*See also CHEST, SURGERY OF.*)

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1927, June, 795; ²*Journal-Lancet*, 1926, Nov. 15, 526.

ENTERIC FEVER. (*See* PARATYPHOID; TYPHOID.)

EPIDERMOPHYTOSIS. (*See* SKIN, FUNGUS INFECTIONS OF.)

EPILEPSY.

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

Although the clinical phenomena of epilepsy are familiar to medical men and laymen alike, so that the diagnosis is usually a matter of ease, the physiological pathology of the seizures is still far from being completely understood.

Epilepsy, like cough, is a symptom, which may be caused by a number of different pathological conditions. When we talk of 'idiopathic' epilepsy, this really means that the epilepsy is of unknown origin. A fit or general convulsive attack may be conveniently defined as a sudden, purposeless, disorderly liberation of kinetic energy in a series of motor nerve-cells, resulting in an explosion of simultaneous disorderly movements. In a *Jacksonian* or *localized*

epileptiform fit, the focus of pathologically altered cortical cells may be very small, and the resulting disordered involuntary movements may be correspondingly localized to a single group of muscles on one side of the body. A Jacksonian attack may remain localized to the original group of cortical cells, but it has a tendency to spread to neighbouring linked physiological groups of nerve-cells which in themselves are normal, healthy, and stable. In the case of the *general* or *major epileptic fit*, on the other hand, whilst on occasion we observe a local commencement, consisting in turning of the head and eyes to one side, in most cases universalization of the convulsion is almost immediate, and many series of bilaterally situated cell-groups become unstable and explosive. Hughlings Jackson himself taught that in general epileptic fits the morbid process begins in the frontal lobes, which constitute his 'highest level', from which the process spreads to the 'middle level' of the Rolandic cortex. When, therefore, the limbs and trunk are convulsed in a severe fit, the idea is that simultaneous powerful discharge of whole groups of motor cells in the bilateral Rolandic areas is taking place. The result of this loss of inhibition by the higher centres upon the cortex is at first an absolute contention of movements, mutually cancelling each other and inducing relative muscular rigidity. Then comes the clonic stage, due to gradual and inefficient resumption of Rolandic activity, the movements at first being rapid and gradually becoming slower and of greater range. It is important, however, to realize, as Kinnier Wilson¹ reminds us in a thoughtful lecture, that ordinary co-ordinated movements may and do occur along with and separate from those that are 'convulsed'. For example, apart from the latter, the epileptic patient may during the fit make champing movements of his jaws, may smack his lips, spit, or make clutching movements at his throat. Further, when the convulsive phase is over, and while still unconscious, he may make even more elaborate movements of his limbs, such as plucking at his clothes, etc., all of which movements present the characteristic features of purposive, 'voluntary', cortical movements, except that they are outside his voluntary control. Their neural site, although cortical, cannot be Rolandic. The convulsive movements proper—violent, powerful, disorderly, and generalized—cannot be regarded as anything other than caricatures of normal movements.

The phenomena of the epileptic aura further corroborate the view that the manifestations of epilepsy must be essentially cortical or transcortical in site; they cannot be infracortical. An aura, of course, is an hallucination, consisting in a sensation, crude or elaborate as the case may be, and referred by the patient to some part of the body or limbs, or to one of the special senses. It is therefore of a different order from the convulsive movements. It is a psychical phenomenon, in consciousness. Physiologically it arises during functional activity of some or other cortical sensory mechanism. The aura is the one thing about the epileptic fit that is not disorderly, distorted, or caricatured. The problem of its origination is that of hallucinations in general. Whether it is to be regarded as a release phenomenon or an irritative phenomenon is difficult to decide. Even if inhibitory control is at first removed by some equally unknown and speculative process, some form of excitation may still be necessary to 'touch off' the prepared neural centre.

With regard to the question of consciousness in epileptic fits, some epileptic attacks are attended by loss of consciousness; others are not. Unconsciousness may supervene at the outset or develop later; it may be extremely brief in duration, or may continue for some time after all convulsions have ceased. Further, of itself it is no index of the severity of the fit. A severe Jacksonian attack may from first to last involve no loss of the senses, whilst a *petit mal* seizure may consist of little else than a transient flash of blankness, an '*absence*'

épileptique'. The most plausible explanation of sudden unconsciousness in epilepsy is that of transient cessation of the circulation, suggested by A. E. Russell² in 1909. If we happen to be feeling the pulse of an epileptic at the moment of onset of a fit, it will sometimes be noticed that the heart suddenly stops for a few seconds. The epileptiform convulsions of Stokes-Adams' disease, or heart-block, are also of significance in this connection. Blanching of the cortex has actually been seen during a fit. Nevertheless, the theory of simple cerebral anæmia is hardly sufficient to account for the variability of the clinical phenomena, unless we can postulate such cortical anæmia as being localized to certain vascular areas of cortex, and, even then, we cannot adequately explain why sudden cortical anæmia should occur in paroxysms.

What, then, are the factors which facilitate epileptic seizures? The longer we study chronic epileptic patients, the more are we impressed by the probable existence in them of a fundamentally or inherently predisposed irritability of the cerebral cortex, so that stimuli which in the normal brain would not produce fits, do so in the epileptic. During the last ten years A. Gordon,³ of Philadelphia, has kept records of 200 epileptic patients with a view to studying the various accidental or incidental situations which immediately preceded the convulsive seizures. His results were as follows:—

	Cases
1 Dyspeptic manifestations in a normal gastro-intestinal tract ..	40
2 Consumption of nitrogenous food	10
3 Chronic gastro-intestinal affections (gastritis, dilatation of stomach)	20
4 Intestinal parasites	10
5 Alcohol	14
6 Fatigue	8
7 Malnutrition	12
8 Insomnia	12
9 Atmospheric changes	10
10 Physical effort	17
11 Variation in tension of cerebrospinal fluid	17
12 Traumata	30

In the above list the cases of chronic gastro-intestinal disorder included those of constipation or diarrhœa. Those of consumption of nitrogenous foods were especially of meats and eggs, sometimes fish, which provoked the epileptic seizures; there was a great variation in the individual susceptibility. In this group no evidence of a pathological state of the gastro-intestinal tract could be discovered. Chronic gastro-intestinal disorders as causal factors included hyperchlorhydria, hypochlorhydria, enteritis, etc., all demonstrated by radiographic and chemical studies. In the cases of intestinal parasites their expulsion was followed by immediate improvement, although there was never total disappearance of the attacks; on the other hand, return of the parasites led to increased frequency of the seizures. The foregoing groups of cases evidently belong to the toxic category, and it may be that the epileptic attacks are to be considered as anaphylactic reactions to the entrance of abnormal proteins. To the toxic group also belong the cases in which alcohol played a provocative rôle. The group of cases associated with fatigue was an interesting one. Some patients observed that when on holiday they had opportunities of taking unusually long walks, the latter were invariably followed by attacks, evidently from undue physical fatigue. The cases ascribed to malnutrition were all in patients of the adolescent period of life, underfed and anæmic. In the cases associated with insufficient sleep, whenever these individuals happened to have a poor night, averaging perhaps one or two hours of sleep, early next morning there would be a convulsive seizure. So striking was this phenomenon that the patients usually took precautions to have a hypnotic remedy at hand, so as to avert the morning epileptic seizure. The cases associated

with changes in the weather were all females in whom, immediately preceding a storm and heavy rainfall, an attack would invariably occur. The phenomena were so constant that these patients would usually keep some relative in the room to watch them at such times, in order to prevent injuries during the seizures. Severe physical effort as a provocative factor was observed in men only, e.g., lifting heavy weights, stooping down, or stretching up to reach objects at a higher level. Doubtless the attacks in such cases were associated with sudden alterations of the cerebral circulation. A curious group was that in which the patients had convulsive seizures during variations induced in the pressure of the cerebrospinal fluid. In seven of these the withdrawal of fluid by lumbar puncture, in small amounts of 5 to 10 c.c., would be followed by an epileptic attack. That this was not necessarily due to diminution of intracranial pressure is shown by the fact that, when 5, 10, or 20 c.c. of physiological saline solution was injected into the spinal theca, following the lumbar puncture, epileptic fits were also induced. It is evident therefore that hypotension as well as hypertension could be equally incriminated. In another series of cases, traumatism of various sorts played a significant rôle. In some of these the epileptic attacks had begun prior to the trauma; then, following some other insignificant trauma, such as a fall on the pavement, a twist of the wrist or ankle, or a fall down a low flight of stairs, similar convulsive attacks recurred.

A survey of the foregoing widely different data makes it evident that they can have no specific value as regards the pathogenesis of epilepsy in general. Doubtless there are many other precipitating factors besides those observed in Gordon's 200 cases. Moreover, if we consider that the very same occurrences, such as trauma, metabolic vicissitudes, hypotension or hypertension of the cerebrospinal fluid, etc., are not followed by serious symptoms in normal individuals, the absence of their specificity is still more evident. The fact that these factors in some persons do, and in others do not, induce epileptic attacks, demonstrates the strong probability that there are certain brains which possess a specific epileptic predilection, i.e., that the central nervous system is fundamentally or inherently predisposed to irritative phenomena by virtue of special intrinsic morbid characteristics, whether personal or hereditarily acquired.

Recognizing, then, that there are many factors in the causation of epilepsy, failure of treatment in any given case means that the particular etiological factor in that case has escaped our recognition, whilst success in a given case may mean that we have hit upon the precipitating etiological factor. Unceasing biological investigation and research are therefore indispensable for the determination of the causative factors in each individual case of essential epilepsy. Hereditary factors in the germ-plasm, of course, are beyond the range of treatment, but many provocative factors, such as those above described, are amenable to treatment by avoidance.

TREATMENT.—Therapeutics consisting solely in drug treatment can only yield empirical results. In all cases of essential epilepsy, in our present ignorance as to its pathogenesis, we should endeavour to trace all possible circumstances which facilitate or provoke the seizures, bearing in mind that we are dealing with brains which possess a special excitability of the cortex.

Dietetic Treatment.—M. G. Peterman,⁴ originally of the Mayo clinic, and now of Milwaukee, has carried out interesting observations on the effect of a **Ketogenic Diet** in epileptic children. He recalls the fact that starvation often causes complete cessation of epileptic fits. Starvation, of course, can only be used as a temporary procedure, and, when food is again given, the attacks recur. During fasting, and coincident with the improvement in the epilepsy, certain changes are observed in the blood chemistry, notably an increase in the ketone

bodies. On the hypothesis that the ketosis and tendency to acidosis produced by starvation is the efficient factor in controlling the epileptic fits, Peterman has tried the effect of a ketogenic diet and claims successful results. The diet is a low carbohydrate, low protein, and high fat ration, adjusted for the individual patient. It is preceded by at least one week of starvation, or a longer period if necessary, until the attacks cease. During the starvation period the patient is kept in bed and may be given water, clear broth, and bran wafers (of no food value) freely. From 6 to 8 oz. of orange-juice are allowed daily. At the end of the starvation period the prescribed diet is started abruptly. The basal metabolic requirement of the patient is calculated according to the Du Bois tables, and an additional 25 to 30 per cent of calories are allowed for energy exchange. The total allowance should not exceed 1800 or 2000 calories. The body-weight should be kept at or below normal. The diet should be made palatable and attractive. The child's co-operation must be enlisted, and he must be protected against all dietetic temptation. Any tendency to nausea or vomiting can be quickly controlled by orange-juice. This ketogenic diet produces a ketosis with a tendency to acidosis. Acetone appears in the breath within two or three days after the diet is instituted, and in the blood and urine on the third and fourth days. The acetone bodies may increase from twice to forty times the normal. Peterman believes that both ketosis and a tendency towards acidosis are necessary for the control of convulsions by the ketogenic diet, and that ketosis alone or acidosis alone is not sufficient. A sample menu is subjoined:—

<i>Breakfast</i>	<i>Dinner</i>	<i>Supper</i>
60 gm. fruit, 10 per cent carbohydrate content	Beef broth	25 gm. vegetables, 3 per cent carbohydrate content
20 gm. bacon (fat)	20 gm. vegetables, 20 per cent carbohydrate content	25 gm. salad dressing
1 bran cake	25 gm. vegetables, 3 per cent carbohydrate content	16 gm. butter
28 gm. butter	25 gm. salad dressing	Ice cream, special recipe
	44 gm. butter	
	40 gm. steak	
	Jelly, special recipe	

Success is mainly a question of ability to carry out the prescribed diet in careful detail. The cases must be carefully selected, and not merely patients, but especially their parents, must be selected who are willing to co-operate and who are able, mentally and financially, to carry out the diet at home.

If the convulsions continue, the carbohydrate may be reduced to 10 gm. and the fat pushed to the limit of tolerance. Once the attacks are under control, the diet is continued for three months, even through all ordinary intercurrent illnesses. If there have been no attacks during this period, the carbohydrate is now increased by 10 gm. After another month of freedom from attacks, the carbohydrate is again increased, and so on, until the carbohydrate reaches 50 gm. By this time the fat may be reduced by 15 or 20 gm. During the next six months, the carbohydrate may be further increased by 10 gm. on alternate months, and the protein by 5 gm., alternating with the carbohydrate. The fat is decreased every three or six months in proportion. These changes are made according to the reaction of the individual patient. The proportions of carbohydrate, protein, and fat are thus gradually restored to normal, whilst the attacks are kept under control. Peterman has now treated fourteen epileptic children who have completed this ketogenic diet course and are now on normal diets. All have been free from epileptic attacks for from six months to three years after their return to normal diet.

Helmholtz,⁹ of Rochester, Minn., has for five years carried out observations similar to those of Peterman. The ketogenic diet gave striking results from

the first. A considerable number of failures are attributed to inability to control the diet properly. Nevertheless, 29 out of 91 young patients have been freed from attacks by means of the ketogenic diet alone; 20 others were improved, so that 54 per cent have been definitely benefited by the dietetic treatment; 46 per cent of the patients were not benefited, although many of them were temporarily improved.

Medicinal Treatment.—The drug treatment of epilepsy is mainly directed to the diminution or suppression of the attacks. In one sense the fit itself is but the terminal process of a long series of antecedent causes, and we are simply repressing the effect and not the cause, i.e., we are treating a symptom and not a real disease. Be this as it may, the first thing that the patient and his friends demand is the arrest of the fits. All drugs which act as sedatives of the cerebral cortex tend to depress the energy of the cardiovascular system. This may be overcome in part by combining them with vascular tonics. Still more disadvantageous in epileptics is the host of gastro-intestinal ills which tend to be made worse by sedative drugs. Notwithstanding such drawbacks, we are justified in using sedative drugs with the object of rendering the seizures less frequent and less severe. We have also to bear in mind the occasional patients in whom a seizure at long intervals gives a notable sense of relief, and in whom it serves as a sort of safety-valve, not to be unduly repressed. These cases, however, are exceptional, and in most cases our first endeavour is to check the frequency of the attacks.

Bromide treatment has now held the field for over half a century and is still the most widely used, notwithstanding certain disadvantages of its regular employment, including its tendency to produce mental apathy, impairment of digestion, and acne of the skin. The average dose for ordinary cases, in adults, is from 20 to 30 gr. of one of the bromides, or of the combined bromides of sodium, potassium, and ammonium, two or three times a day, increasing the dosage just before the expected time of the seizure. Bromides should be given in plenty of water. Their efficacy appears to be definitely enhanced by the withdrawal of extractives (as in meat) and of chlorides. A combined vegetarian and salt-free diet therefore permits us to use a smaller quantity of bromide for the controlling of the attacks. Of recent years **Luminal** has been increasingly used instead of bromides for the treatment of epilepsy. Sometimes luminal succeeds where bromides have failed. Moreover, luminal does not produce the mental, gastro-intestinal, or skin disorders due to prolonged or excessive use of bromides. Large doses are not necessary. Usually $\frac{3}{4}$ gr. to $1\frac{1}{2}$ gr. of sodium luminal night and morning is sufficient to produce whatever benefit this drug can accomplish. Hypnotic doses are not advisable.

Numerous accessory drugs have been tried from time to time, but none of them approach bromide or luminal in their efficacy. **Endocrine Extracts** have been used and are indicated in epileptics who present definite evidences of endocrine disorder, whether of the thyroid, ovarian, or pituitary gland. Adrenalin however, should not be used, for it tends to precipitate convulsions in sensitive patients. In fact, it has been used for diagnostic purposes to precipitate an attack in patients suspected of being doubtfully epileptic. Amongst other drugs which have been employed from time to time we may mention **Chloretone**, boron salts, either in the form of **Borax** or of **Sodium Boro-tartrate**, **Crotalin** (the venom of rattle-snake poison), **Pilocarpine**, and numerous others.

Status Epilepticus.—In the treatment of status epilepticus, where the patient passes from one major fit into another, so that his life is in imminent danger, our most efficient means is to perform **Lumbar Puncture** and withdraw 20 to 50 c.c. of cerebrospinal fluid, until the intracranial pressure is relieved. This in itself may check the fits. We may supplement this by injecting intrathecally

50 c.c. of a 1 per cent solution of Sodium Bromide, or 2 or 3 gr. of Sodium Luminal in solution. The efficacy is likely to be greater if such drugs are administered by Cistern Puncture rather than by the lumbar route.⁶ The most rapid effects of all are by intravenous injection. According to H. A. Patterson, Le G. A. Damon, and P. Levi,⁷ the effect in status epilepticus is almost immediate, as compared with intraspinal administration which was active in half an hour, subcutaneous injection 15 to 30 minutes, and oral administration 1 to 2 hours.

REFERENCES.—¹*Brit. Med. Jour.* 1926, ii, 11; ²*Clinical Jour.* 1909, Sept.; ³*Med. Jour. and Record*, 1926, Aug. 4, 151; ⁴*Jour. Amer. Med. Assoc.* 1927, June 11, 1868; ⁵*Ibid.* 1927, June 25, 2028; ⁶*Políclínico*, 1926, Aug. 9, 1113; ⁷*Jour. Nerv. and Ment. Dis.* 1926, May, 446.

ERYSIPELAS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

X-ray Treatment.—E. S. Platou and L. Rigler¹ claim striking results from the X-ray treatment of erysipelas, and the technique they employ is as follows: Distance from the skin, 10 in.; filter, 2 mm. of aluminium; 111 kilovolts (peak), which is equivalent to a 'seven-inch spark gap' between moderately blunt points; and 5 ma. Exposure 5 minutes, except the scalp, where only 4 minutes. This is equivalent to a dosage sufficient to produce a mild erythema. Facial cases are treated in four areas: (1) The centre of the face and forehead; (2 and 3) The lateral surfaces of the neck and face; (4) The scalp. The last three areas are always treated, whether they are involved or not. In body cases a large margin of normal skin is treated, the whole being divided into areas of approximately 300 sq. cm. The authors have treated two series of cases, 23 by X rays and 18 by other methods. The tables show a marked shortening of the return of the temperature to normal, and also to complete convalescence. J. E. Harrison and J. D. Lawson² have also employed X rays in the treatment of this condition with success. They have treated eleven patients. In only one were as many as three applications given. Exposures were made to the affected area with a zone of 5 cm. of healthy tissue around; unfiltered radiations at 100 kilovolts, 50 cm. distance, and 35 ma. minutes, applied over each area treated—this equals two-thirds epilating or half an erythema dose. A second dose is given in two days if necessary. The temperature usually falls rapidly and the pain is quickly relieved.

Treatment by Scarlet Fever Antitoxin.—E. B. Schabetai³ has treated 11 cases of erysipelas, of which 10 were of the facial type, with scarlet fever antitoxin serum (Behring). A dose of 20 c.c. was injected, and in several cases caused immediate and permanent fall of temperature and clearing up of the lesions. In other cases two injections were necessary, and in only one case three. The time when the second dose was given is not always stated, but the quantity was 20 c.c. in each case. All cases cleared up well.

Immunization with Soluble Toxin from *Streptococcus Erysipelatis*.—K. E. Birkhaug,⁴ whose work on the bacteriology of erysipelas was recorded in last year's MEDICAL ANNUAL, has shown that the *Streptococcus erysipelatis* produces a soluble and thermostable toxin when grown under certain conditions. During the acute stages of erysipelas, the patient's skin reacts positively with 10 skin-test doses of this toxin until about the tenth day of the disease, when the skin reaction rapidly becomes negative to multiple skin-test doses of toxin. Simultaneously with the advent of skin immunity to the erysipelas toxin, the toxin that previously was isolated from the patient's blood serum and urine has completely disappeared, and a gradually increasing amount of antitoxin appears in the patient's blood serum, which in proper mixtures completely neutralizes the toxin produced by *Str. erysipelatis*. Active immunity against the erysipelas toxin, as conferred on a patient by an attack of erysipelas, is found to disappear

as soon as six weeks after the onset of the disease in certain persons when such person's negative skin reactions to 10 skin-tests dose of toxin suddenly become positive. Retesting of the patient's blood serum at this time reveals the absence of antitoxic substance. Patients with a definite history of recurrent attacks of erysipelas at frequent intervals are found to contract the disease almost simultaneously with the reappearance of a positive skin reaction to 10 skin-test doses of toxin. A course of active immunization against recurrent attacks of erysipelas, by means of bi-weekly intramuscular injections of 500, 5000, and 50,000 skin-test doses of the extracellular and intracellular toxins produced by *Str. erysipelatis*, appears to produce in the patient's blood serum a rapidly increasing concentration of antitoxin, so much so in certain persons that 1 c.c. of the patient's blood serum is able to neutralize completely 1800 skin-test doses of toxin. Twenty-four patients with definite histories of frequent recurrent attacks of erysipelas have been actively immunized by means of the toxic filtrate of *Str. erysipelatis*, and persons among these who previously suffered from habitual attacks of the disease from every sixth to twelfth week have been free from subsequent recurrent attacks over a period approaching two years.

REFERENCES.—¹*Arch. of Internal Med.* 1926, Nov., 573; ²*California and West. Med.* 1927, April, 485; ³*Munch. med. Woch.* 1927, June 17, 1015; ⁴*Jour. Amer. Med. Assoc.* 1927, March 19, 885.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—F. Lülldorf,¹ who records an illustrative case of *staphylococcal erysipelas*, states that Fehleisen's view that a streptococcus was the only causal agent of erysipelas was shown by subsequent observers to be incorrect. In 1901 Jordan reported two cases in which undoubted staphylococci gave rise to erysipelas as well as to suppurative osteomyelitis, abscesses, etc. Typical erysipelas has been produced experimentally by Jordan, Felsenthal, and Petruschky with staphylococci, by Neufeld with pneumococci, by Petruschky with *B. coli*, and by Rheiner with typhoid bacilli. According to Kulenkampff the following features are typical of staphylococcal erysipelas: (1) The peculiar bluish colour of the skin which later assumes a dark-blue tint; (2) The presence of dark cords like strings of pearls and later small bullae in the affected areas; (3) A low tension pulse; (4) The euphoria of many of the patients; (5) The occurrence of miliary phlegmons in the terminal stage; (6) Termination by staphylococcal septicæmia. The disease lasts from 5 to 24 days, the average time being 13 days. In well-developed cases the prognosis is unfavourable. Lülldorf's patient was a man of 48, in whom the condition of the left arm was at first mistaken for anthrax. Recovery took place, the favourable issue being attributed to the fact that only one extremity was involved.

I. L. McGlasson,² who records 17 cases of recurrent erysipelas, quotes statistics showing that while 81 to 90 per cent of all cases of erysipelas occur on the face only, 8 per cent involve the legs. Of his 17 cases, 16 occurred on the feet and legs in association with dermatitis of the feet, and 1 on the hands in a dentist the subject of procaine dermatitis, who had had eight attacks of erysipelas extending over a period of three years. Treatment was unsatisfactory until the dermatitis was shown to be due to ringworm, treatment of which resulted in arrest of the complaint.

TREATMENT.—A. J. Schaffer and P. E. Rothmann⁴ treated 19 out of a series of 101 cases of erysipelas in infants and children by Intravenous Transfusion of Whole Citrated Blood, and found that the mortality was distinctly lower than in the controls.

REFERENCES.—¹*Munch. med. Woch.* 1926, 2211; ²*Arch. of Dermatol. and Syph.* 1926, xiv, 679; ³*Jour. Amer. Med. Assoc.* 1927, lxxxviii, 885; ⁴*Amer. Jour. Dis. Child.* 1927, xxxiii, 116; ⁵*Munch. med. Woch.* 1927, 1015.

ERYTHEMA INFECTIONOSUM.*J. D. Rolleston, M.D.*

L. O. Finkelstein and R. A. Wilfand* record an outbreak of 12 cases which took place between March 4 and 23, 1925, in a children's home at Kiew, and 4 other cases in private practice. Opinions are divided as to the contagiousness of erythema infectionosum. Tobler, Herrick (*see MEDICAL ANNUAL*, 1927, p. 145), and Stoos have reported epidemics of the disease, whereas Escherich, Tschamer, and Pospischill have admitted children with erythema infectionosum to the general ward and have never seen any secondary cases arise. The contagiousness in any case is only slight, as Herrick saw only 22 cases among 5000 school children. The present writers' observations as to the length of the incubation period agree with those previously recorded, viz., 7, 14, or 17 days. The duration of the disease is hard to determine, as, in cases with a vivid rash, the dirty colour of the skin persists for a long time, and even if the eruptive period only is taken into consideration, its duration may range from 3 to 30 days. Like most of their predecessors the authors did not observe any complications. It is uncertain whether the disease confers any immunity. The prognosis is absolutely favourable, and no treatment is required.

REFERENCE.—¹*Arch. f. Kinderh.* 1927, lxxxi, 120.

ERYTHRÆMIA.*Ivor J. Davies, M.D.*

G. E. Brown and H. Z. Giffin,¹ of the Mayo Clinic, present a full clinical and physiological study of seven cases of polycythæmia vera (erythræmia) with the result of treatment by Phenylhydrazine. This drug, first used in the production of experimental anæmia in animals, has been administered to patients with polycythæmia vera because of its specific effect in the destruction of erythrocytes. Injected subcutaneously in animals it was shown to be very toxic, but given by mouth to patients its toxicity seems to be low. Recent experiments have also demonstrated that when the drug was given by mouth to the experimental animal the toxicity was much lower. Acetyl phenylhydrazine is being used experimentally because of evidence which points to a still lower toxicity. These observers found that the administration of phenylhydrazine had definite, constant, and specific effects on destruction of blood and reduction of erythrocytes, and produced symptoms indicative of a hæmolytic crisis. The drug was given in doses of 0.1 gm. three times a day; the total amount given varied from 3.4 to 7.6 gm., the average total being 5.7 gm. It was estimated that each gramme of phenylhydrazine brought about the destruction of an average of 6 gm. of hæmoglobin. It has been found wise to discontinue the use of the drug when the erythrocytes drop to 4,500,000, and it is estimated that destruction of blood will continue for approximately a week longer. Phenylhydrazine hydrochloride, in general, causes more consistent improvement in the symptoms, and a more constant reduction in the blood volume, than either radiotherapy or venesection. The questions involved in the occurrence of thrombosis during treatment, and the ultimate toxicity of the drug, especially on the liver, can be decided by more extended experience and more prolonged observation.

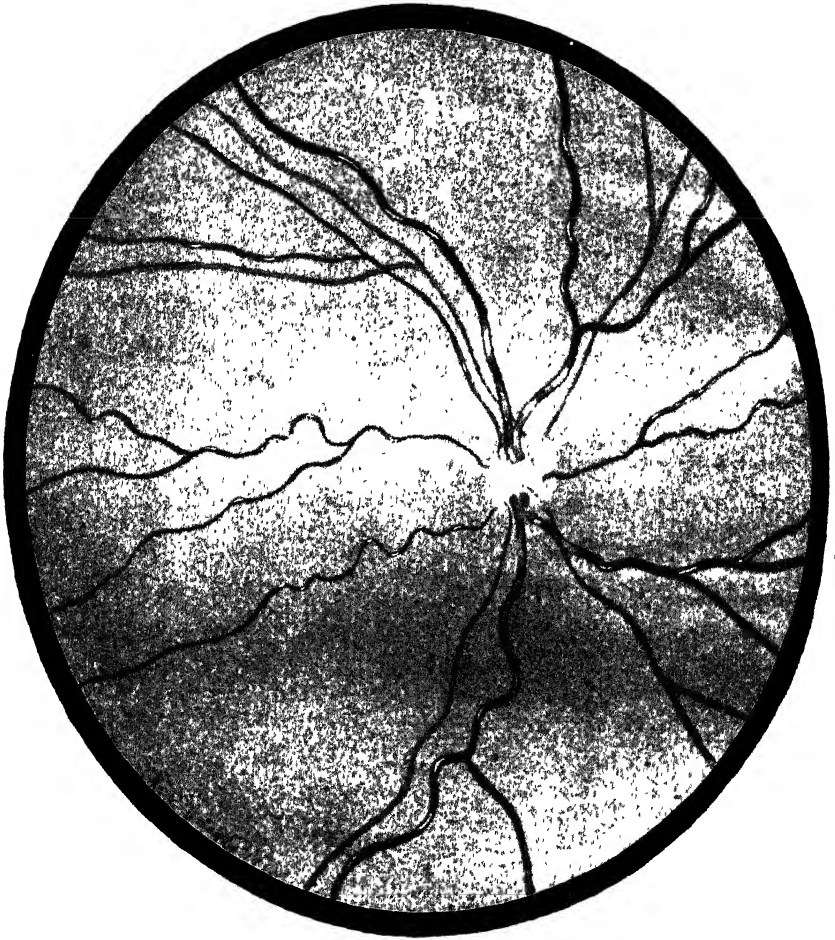
REFERENCE.—¹*Arch. of Internal Med.* 1926, Sept., 321.

EYE AFFECTIONS ASSOCIATED WITH DISEASE OF OTHER ORGANS.*Lt.-Col. A. E. J. Lister, I.M.S. (retd.).*

Raynaud's Disease with Ocular Complications.—S. J. Appelbaum and M. L. Lerner¹ describe the ocular complications of a case of Raynaud's disease. The interesting feature of the authors' case was that there was a marked papillitis in each eye, with a swelling of the optic discs of 4 D. hæmorrhages, and exudates. Papillitis would appear to be very rare. The usual picture of

PLATE XIV

RAYNAUD'S DISEASE WITH OCULAR COMPLICATIONS



Swelling and obscuration of optic disc and changes of retinal vessel.

By kind permission of the 'American Journal of Ophthalmology

constriction of the arteries and overfilled veins was present (*Plate XIV*). The patient recovered with good vision in both eyes. Other cases are mentioned, and references given which will be useful to those seeking further information on this subject. [Ocular complications in Raynaud's disease, though well known, do not appear to be common, judging from the references to them in modern text-books of medicine. Osler,² who had an enormous clinical experience, says he looked in vain for signs of constriction of the retinal arteries in several very typical cases. In one of these the local syncope of the hands was extreme, and in two cases there were marked cerebral symptoms.—A. E. J. L.]

Diabetes and Tobacco Amblyopia.—G. E. de Schweinitz and A. G. Fewell³ say that it is universally admitted, indeed definitely established, that the optic nerves of the subjects of diabetes are peculiarly susceptible to the deleterious influences of tobacco. They say, however, that though this fact is well known to ophthalmologists, it seems to have escaped general attention. The difference between the scotoma due to diabetes alone and that due to tobacco can be established by perimetry. Details are given for which the original article must be consulted. [It is well that attention should be drawn to this, as some patients are apt to stave off hunger while on a low diet by smoking. This may lead to what, for them, is excess.—A. E. J. L.]

The Prostate as a Remote Focus of Infection in Ocular Inflammations.—W. Zentmayer,⁴ after a detailed study of several cases, concludes: (1) That the prostate may be the source of infection in certain ocular inflammations. (2) The prostatic infection is probably more often non-gonococcal than gonococcal. (3) The metastasis, as in other focal infections, may occur in any of the ocular tissues susceptible of inflammatory reaction, but the uvea and cornea are probably most often involved; the latter, and also the iris alone, especially when the gonococcus is present. (4) The fact that an inflammation persists after the removal of a suspected focus of infection does not prove that this was not the primary source of infection, for the resistance of the tissues may have been so reduced by this inflammation as not to be able to withstand the action of organisms or toxins of much less virulence from some other part of the body. (5) Only when a metastatic inflammation subsides after the removal of one possible source of infection does it prove this to have been the exciting cause.

REFERENCES.—¹*Amer. Jour. Ophthalmol.* 1926, Aug., 569; ²Osler and Macrae, *Principles and Practice of Medicine*, vi, 637; ³*Therap. Gazette*, 1926, Sept., 623; ⁴*Jour. Amer. Med. Assoc.* 1926, Oct. 9, 1172.

EYE AFFECTIONS, GENERAL. (*See also CATARACT; CONJUNCTIVA, DISEASES OF; CORNEA, DISEASES OF; EYE AFFECTIONS ASSOCIATED WITH DISEASES OF OTHER ORGANS; OPTIC NERVE, AFFECTIONS OF; RETINA, AFFECTIONS OF.*)

Lt.-Col. A. E. J. Lister, I.M.S. (retd.).

Is Viewing a Cinema Film Bad for the Eyes?—This is a question which is very frequently put to ophthalmologists, and doubtless to other medical men. It is a very important one, as the cinema is becoming more and more used for educational purposes. Certain writers have recently tried to prove that it causes even less ocular fatigue than reading ordinary print. The reviewer, not being satisfied with their criterion of fatigue, consulted an expert and was told the results were of no value. This serves, however, to show that the matter is exciting attention. Having arrived at certain conclusions as the result of a long study of the subject, he decided to ask Sir John Herbert Parsons, who has specially investigated this matter. He kindly replied as follows:—

“In my opinion there is no satisfactory evidence that viewing a good cinema film under satisfactory conditions is in any way deleterious to the eyes. When

aching of the eyes and head, etc., follow, it is generally attributable to uncorrected errors of refraction or muscle unbalance, or to unhygienic conditions, such as bad ventilation, smoky atmosphere, etc.

"In a well-designed cinema there is no glare: either the general lighting is extinguished or carefully dimmed and shaded. The illumination on the brightest part of the screen when a picture is being exhibited is of the order of one foot candle, which is astonishingly low. Since no great difficulty is usually felt in observing detail in a good film, this low illumination is actually restful. Complaint is often made of flicker. I distinguish two types of flicker—physiological and mechanical. Physiological flicker occurs when a bright light is alternated with darkness at a speed which is less than the critical frequency of flicker. Experiment has shown that when the apparatus is run without any film, so that there is the maximum brightness, the normal rate is sufficient to abolish flicker on the screen, except a faint flicker in the peripheral part of the field. This being the case, it is clear that the same rate will completely abolish flicker for the lower intensities of light when a film is interposed.

"Mechanical flicker is of various kinds. In its worst forms it occurs with old films in which the sprocket holes are worn. This causes a very irritating jerkiness which is certainly unpleasant and probably deleterious. Moreover, old films are usually scratched and hence show lines, as if a perpetual rain-storm were in progress. Mechanical flicker is also caused by people moving transversely across the field of view too near to the camera when the picture is being taken. This defect is usually of short duration in any given film.

"Probably the worst source of fatigue is due to the screen being placed too high, or the front seats too close to the screen. This necessitates continually looking upwards, whilst at the same time converging. Movement of the eyes upwards is the last developed phylogenetically and the most tiring form of conjugate deviation. Normally it is associated with a tendency to divergence. Hence the screen should be kept as low as is consistent with a good view by all the audience, and front seats are to be avoided.

"Very lateral view of the screen is also to be avoided, especially near the front rows. It causes distortion of the figures in the picture, which also exhibit a mechanical jerkiness of movement. This fault is specially noticeable when, as is often the case, the surface of the screen is made highly reflecting by aluminium paint or by being covered with glass beads. These screens give a garish glitter to the pictures when viewed from the front, but ought to be abolished both on artistic and hygienic grounds."

[The reviewer wishes to express his thanks to Sir John Herbert Parsons for the above. His own experience so far as it goes entirely agrees with the views expressed. (See also MEDICAL ANNUAL, 1922, p. 156, in this connection).—A. E. J. L.]

Care of the Eye in Middle and Later Life.—E. Jackson¹ says that inability to read without glasses is commonly recognized and commented on as a sign of age. "Old enough to wear glasses," "Can't see without glasses," are common phrases. The soft crystalline lens of childhood yields easily to the influence of its capsule, and by the natural elasticity of its fibres assumes the strongly convex shape of accommodation for near objects when freed from the tension of its suspensory ligament. With increasing age the power to accommodate for near objects is first diminished, then lost. This is a universal change in the human eye that begins in early life, becomes obtrusive at 40 to 45, and after that dominates all the use of our eyes. It has been urged that, whereas the optician was not able to measure refraction properly in early life, because he could not use cycloplegics, he could be trusted to do so

in middle or later life, when it was assumed cycloplegics were not needed. It has been overlooked that diminished accommodation makes the accurate correction of refractive errors *more important*. One half of a dioptre of astigmatism left uncorrected, in an eye with 1 D of accommodation, may make more trouble than 1 D of astigmatism with 3 D of accommodation. Or 1 D of hyperopia in the former may be as serious as 3 D of hyperopia in the latter, each requiring the maximum exertion of accommodation to overcome the defect. It has been overlooked that damage done by eyestrain increases as the recuperative powers and nutritive resources of the body diminish with age; that results of the same strain, over-use, or indiscretion are more likely to do permanent harm than in youth. It is poor policy to neglect them or accept for their assistance *inferior optical corrections*. Some physicians have been relying on opticians for the correction of presbyopia for themselves or their patients. This cannot be accurately corrected till the error of refraction is exactly determined. Neglect of the eyes in later life is neglect of reasonable care of health, aside from the important conditions recognizable under medical supervision that will determine the continued retention of good vision, or even life, to normal limits.

The reviewer can only cull a few further points from this valuable paper. Over-use and strain of the eyes hasten cataract, though of the actual cause of senile cataract we know little. Of the large proportion of people who develop cataract by the age of 70, few will ever be disabled by it greatly. Very few, perhaps one or two, will ever have to face the question of an operation for removal of cataract. From a study of 539 cases, the average time taken for a cataract to prevent useful vision and require operation was fifteen years. Cataract beginning after 60 is not likely to mature till 80. The poor vision of early cataract is often not dependent on the opacity of the lens wholly but on changes in the refraction. Haloes round lights do not *always mean glaucoma*. They occur in other conditions. Eserine may provoke iritis in glaucoma. Harm is done because of failure to recognize the limitations of age, rather than conditions that truly come on and increase with age; and also the extent and way that the eyes may be used to do what would be harmless if these limitations and conditions were carefully observed. The man who has smoked freely from boyhood must understand that, in continuing to smoke freely, he is in danger of tobacco amblyopia as well as of angiosclerosis. Ladies should limit fine 'fancy' work. The constant reader of other years must limit his hours of reading. The lessened activity of nutritive processes, the diminished powers of repair of injuries, the lessened endurance of age, must be accepted if we are still to continue to be as useful and as influential in the world as we might be.

[Great good can be done by practitioners in safeguarding the eyes of their patients. They alone are often able to give such advice as Jackson, out of his wide experience, suggests. Too often is the eye regarded as the 'willing horse' to be worked in season and out of season! People who have been working hard with their eyes all day and are physically tired, often sit down and try to read for several hours in the evening. If they would only break up the period, as of course many, taught by experience, do, by a few minutes' rest at intervals, much help would be afforded to the eyes. Patients convalescing from acute illnesses such as influenza, are often left alone all day to amuse themselves by reading. Eyestrain is not infrequently the result. If they were told to play, say, 'patience', or do any kind of coarse handwork at intervals, it might avert this. The old custom of waiting for four or five years, when presbyopic, before getting an increase in the power of the glasses, is out of date and should be discarded. Such patients should be seen every two years

if they use their eyes much. If help is required it should be given, rather than allow them to wait till they can struggle on no longer.—A. E. J. L.]

Phototherapy in Ocular Diseases.—There is an ever-increasing amount of evidence as to the value of different forms of phototherapy in ocular diseases. Two contributions, by English authors, will give the beginner a useful introduction to the subject. C. Goulden,² in a communication of his experience as to the value of Ultra-violet Rays, says he was led to try this treatment first in a case of tuberculous iridocyclitis, so severe that after careful treatment the right eye had to be removed. The possibility of syphilis was considered, though there was no evidence of it, and novarsenobillon was given. The patient was a child six years old. Two months after the removal of the right eye the other eye started the same condition, and, in spite of all treatment, tuberculin included, gradually degenerated; sclerosing keratitis, synechiæ, and waxy corneal precipitates appeared, and, most serious of all, the eye became soft. As a last resort ultra-violet light baths were begun in May, 1924. The effect was miraculous, the author says. The eye immediately began to improve in appearance, and the vision, which was reduced to hand movements, rapidly increased. The enlarged lymphatic glands in the neck became smaller. In April, 1926, the vision in the eye was $\frac{6}{2}$, and the boy could read ordinary print. The eye is white and apparently free from active disease. The cornea is naturally much scarred, and there is atrophy of the iris, etc. There had been, however, no local treatment for eight months. Other successful cases are reported in detail. Very valuable results were also obtained in the treatment of phlyctenular disease. Experience in other diseases was not so favourable.

W. S. Duke-Elder³ agrees with all that Goulden said above, and gives an excellent summary as to the biological action of light and many interesting details as to the technique of treatment, for which the original paper must be consulted. He says, however, that it seems to be definitely established that the diseases most amenable to treatment are the chronic ones; in the acute stages phototherapy frequently does more harm than good. The time of election would appear to be just after the acute stage has passed off, and before the disease can be definitely labelled chronic and the lesion complicated by the accumulation of massive organized deposits, and recovery rendered unlikely or impossible, by extensive tissue degeneration and destruction. In these chronic cases improvement is often slow; but this should never be made an excuse to 'push' the treatment beyond the safe limits of dosage which he indicates. Excessive dosage is harmful, and what, after all, is a natural cure should be allowed to act slowly, gradually, and naturally. The author sums up by saying that phototherapy is by no means a panacea for all ocular disease, but, used with proper discrimination, it is a very useful addition to our methods.

[As illustrating the progress phototherapy has made in the treatment of ocular diseases it may be mentioned that a special department has recently been established at the Royal London Ophthalmic Hospital. By the kind permission of Mr. W. S. Duke Elder, the reviewer was allowed to see something of the work done there. He formed the impression that it is a very useful addition to our methods of treatment, but that in some respects it is still in the experimental stage and only fitted for use by experts. This, they themselves freely admit. The following short summary of his latest experience was kindly furnished to the reviewer by Mr. Duke Elder: "In addition to treatment by general light baths, I use ultra-violet light extensively as a local application in diseases of the anterior segment of the eye. The light is given by an apparatus based on the principle of the Gullstrand slit-lamp. Corneal ulcers, even hypopyon ulcers, and especially recurrent and marginal ulcers, scleritis, sclerosing keratitis, and tuberculous iritis with nodules on

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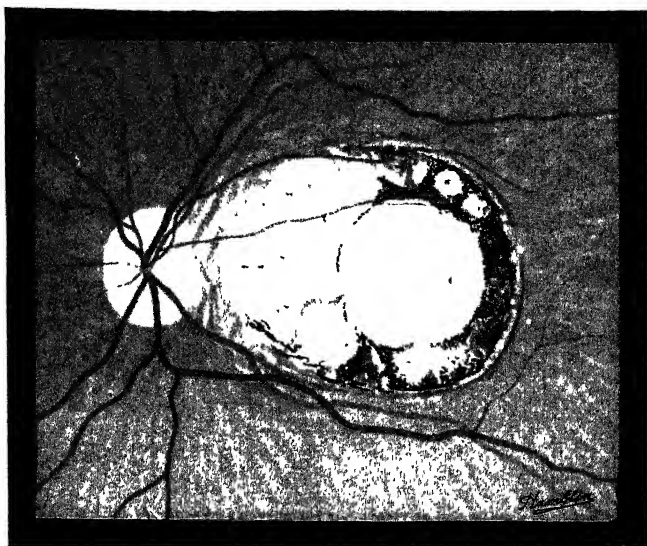
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PLATE XV

COLOBOMA AT THE MACULA (BOTH EYES)



*By kind permission of the
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the anterior surface of the iris, are peculiarly amenable to this method of therapy." The reviewer is much indebted to Mr. Elder for this communication. It may be added that this local application is made for two minutes only at first and gradually increased up to six minutes. Even this may cause a sharp reaction.—A. E. J. L.]

Gilbert⁴ used a mercury-vapour lamp in accordance with the technique of Birch-Hirschfeld. Good results were obtained in *marginal ulcers*. In tuberculous disease of the cornea and sclera the result was not so good as in suppurative inflammation, but several cases of *tuberculous sclerokeratitis* which had failed to yield to previous treatment were healed by ultra-violet therapy. A number of *corneal opacities* were treated with improvement in vision and marked clearing up of the opacities. No results were obtained in parenchymatous keratitis. The best results were obtained in *suppurative inflammations of the cornea*, but only by paying strict attention to the dosage, avoiding under- as well as over-exposure.

The Diagnosis of Hysterical Amblyopia.—H. M. Traquair,⁵ in his monograph on clinical perimetry, gives much valuable information about this important subject. As regards hysterical amblyopia, the author mentions the value of what he calls the 'quantitative method' in clearing up the diagnosis in difficult cases. It will be remembered that, in the words of the author, "the typical field change in hysterical amblyopia, found by ordinary perimetric examination, is concentric contraction, which remains more or less unaltered at different distances or with objects of different sizes. The field therefore is 'tubular' in shape, a form which is necessarily of subjective origin." He goes on to say that the central vision is usually good in spite of extreme contraction. In simple words the quantitative method amounts to this: Say a patient is found to have pronounced contraction of the field, with good central vision when tested with a test object of, for instance, 5 mm. square. If the size of the test object be increased, say, to 20 mm. square, it may make no difference to the size of the field, or, in some cases, even if the test object is increased to the size of half a sheet of note-paper. Also the size of the field may not alter, or only slightly so, even if the distance at which it is taken is increased from 33 cm. to 2 metres. If this is the case, the diagnosis of hysteria is practically certain, especially if the optic disc is healthy. [I have drawn attention to this point as it is easy to make the test and I have found it most useful. The author, in a personal communication, says he does not claim originality for it, but it is original as far as he is concerned, as he discovered it for himself. I am much indebted to him for permission to quote from his book, which is simply invaluable for those who want to get an up-to-date knowledge of perimetry.—A. E. J. L.]

Coloboma at the Macula in Both Eyes.—Plate XV shows pictures of the fundi of a young man first seen by Ernest Clarke⁶ thirty years ago. He had a consultation with the late Mr. H. Juler, who agreed that the case was one of a so-called coloboma at the macula in both eyes. They took a rather gloomy view of the child's prospects which fortunately have not been realized, as he went normally through Harrow School, took his degree at Cambridge, and has been fairly good at games, especially tennis. Both pictures show a large defective area at the macula about three and a half discs in breadth and two in height. In the centre of this area there is a circular pearly-white region a little larger than the disc, ectatic and free from pigment, and on the left side a ciliary artery perforates this. The surrounding area in both cases is marked by patches of pigment, each having a pale centre. There has been no material change in the fundus since he was first seen; no defect of colour vision. As a baby there was nystagmus, which has since disappeared. There is 11 D of myopia

in the right eye and 5.5 in the left, with slight astigmatism in each eye. Vision with correction $\frac{5}{8}$. He has good near vision and can read Jaeger 2. At birth he had other congenital defects indicating arrest of development, such as undescended testes and had development of the facial bones.

[I am much indebted to Mr. Ernest Clarke for his kind permission to use the illustrations of this interesting case. In his letter he says: "I do not know if you will think it worth while to add to your notes what I think is the most interesting lesson to be learnt from the case—that if you start *early* enough nerves and nerve connections can be trained to take on duties for which they were never intended." If the condition this boy had, had started later in life, there is no doubt he would have been more or less blind. I am obliged to Mr. Clarke for this note, as this conclusion does not appear in the original paper.—A. E. J. L.]

Double Optic Neuritis in a Pregnant Woman, probably due to Pregnancy alone.—P. Bailliart and E. Hartmann' describe a most interesting case of double optic neuritis in a perfectly healthy woman 26 years old. She was a primipara, eight months pregnant. Her only complaint was failing vision. This gradually fell to nil; the pupils were dilated and did not react to light. Labour was induced and a healthy child born. Briefly, the authors have surveyed every possible cause, but are forced to the conclusion that it was due to some toxin developed during pregnancy. They, however, adopted anti-syphilitic treatment from the first, though Wassermann was negative and there was no history on either side of syphilis. Neither did the child eight months later show any signs of syphilis. The patient recovered perfectly normal vision in about four months from the commencement of the trouble.

[The authors state that they have reported this case in the hope that one day a correct etiology may be found for such cases. Every ophthalmologist of experience has come across serious affections of the eyes, of unusual type, in which the evidence pointed to some special connection with pregnancy. The reviewer recently, by the courtesy of Mr. Cyril Walker, saw a most interesting case in which double detachment of the retina had occurred during pregnancy. He is much indebted to Mr. Walker for the following note on this case] :—

Double Detachment of the Retina during Pregnancy: Recovery.—"In 1921 a young married woman, during or shortly after her first confinement, gradually became completely blind in both eyes. When I saw her she was very ill, looked very anæmic, and the urine was loaded with albumin. There was very extensive detachment of both retinæ; in fact I could not satisfy myself that there was any place where the retinæ were properly adherent to the choroids. A very guarded prognosis was given. The patient, however, recovered completely and regained good sight. When seen two years later she was again pregnant; vision was good, there was no retinal detachment, but all over both fundi there was a very remarkable choroidal or deep-seated retinal pigmentation in the form of rounded blotches. In some places several blotches had coalesced. In some places there was also a peppering of pigment granules. I hear now the patient is pregnant for the fourth time; she has good sight, and there was no recurrence of the retinal detachment with the second and third pregnancies." [The knowledge of the fact that the patient recovered completely from this truly desperate condition may be of great help to some practitioners.—A. E. J. L.]

Blepharochalasis.—W. L. Benedict⁸ gives an account of this disease, with a bibliography, and reports three cases. It was first described by Fuchs in 1896, and since then has been recorded by several others. The disease is usually found in young persons as an intermittent swelling of the upper lids.

PLATE XVI—BLEPHAROCALASIS



Fig. A.—Stage of blepharochalasis without swelling characterized by wrinkling of the skin of the lid.
MEDICAL ANNUAL, 1928



Fig. B.—Late stage of blepharochalasis. The swelling had been constant for nearly fifteen years.
By kind permission of the Journal of the American Medical Association

PLATE XVII.

BLEPHAROCHALASIS—*continued*



Fig C.—Early stage of blepharochalasis, showing bagginess of the temporal portion of the upper lids without marked alteration in the skin.

*By kind permission of the
'Journal of the American Medical Association'*

It first makes its appearance soon after puberty as a transient œdema of the upper lids lasting for a few hours, the attacks coming on at intervals of a few days or a few weeks. Succeeding attacks last longer, and appear more frequently, until a permanent swelling of the lid, with great thinning of the skin and bagginess of the lids, results. The bagginess and atrophy of the skin are the characteristics of the disease by which the name blepharochalasis is suggested. The onset is usually insidious, and its early manifestations are overlooked or misinterpreted. The diagnosis becomes clear only after permanent changes are brought about in the lids. The disease is more commonly found in young girls, but has been observed in young boys and even in old men. Fuchs observed it in a man past middle life. It has been recognized in later life in persons who have had the swelling of the lid and atrophic appearance of the skin since early youth. Weidler thinks it bears some relation to the beginning of menstruation, but it cannot be directly connected with it, as it occurs in boys. As it appears at about the same age, 10 to 17 years, it may be a result of functional endocrine development. Ascher suggests it may bear some relation to the development of the thyroid. It has been confused with chronic atonic ptosis, which condition it closely resembles, but the latter can be differentiated by the absence of attacks of swelling. The only treatment at present is **Excision** of the redundant skin, with **Fixation of the Lower Margin** of the wound to the upper margin of the tarsus. The ptosis should be treated surgically. If the association of the disease with the development of the endocrine glands can be substantiated, it is probable that medical treatment might be useful in the intumescent stage. In the discussion following the paper, C. Berens said the condition is commoner than the reports in the literature suggest. He had seen two cases. He thought it was due to an allergic reaction. The intracutaneous tests were positive in a woman of 44, who had had the condition three years. She reacted negatively to bacteria, but gave positive reactions to oats, pork, and tomatoes, and dog dandruff. [This condition, which appears to present well-marked features, is of interest to practitioners. Berens says the eyelids are frequently treated by physicians who do not recognize the disease. *Plates XVI, XVII* illustrate well the condition.—A. E. J. L.]

The Mydriatic Action of Adrenalin.—A. Magitot⁹ discusses the action of adrenalin on the pupil, in a paper which is of interest to physicians, as he deals with the use of this drug in the diagnosis of lesions of the cervical sympathetic. As regards its use in ophthalmology, he concludes that, as a mydriatic for clinical use, it has great advantages used as a subconjunctival injection. Two drops of a 1-1000 solution produce in about five minutes a mydriasis which increases rapidly and up to a period of about ten to fifteen minutes, when a submaximal distention is reached. The dilatation begins at the sector corresponding to the point of injection. There is a slight smarting pain, and on this account the author recommends the instillation of some analgesic before the injection. The disagreeable sensation is then reduced to trifling proportions.

The advantages are that it produces practically no interference with the power of accommodation, does not damage the corneal epithelium, and the effect passes off in about two to four hours. For use during operations on the eye, it has the outstanding advantage that *the pupil remains dilated in spite of the opening of the anterior chamber*, which is not the case with atropine. This is of great advantage in certain operations for cataract, etc. To break down adhesions, it should be used, the author thinks, with one of the passive mydriatics, as he terms them—atropine, or better, mydriazine, or euphthalmine—given as an instillation. To dilate a tonically contracted pupil such as one sees in corneal erosions, keratalgia, etc., it should be used with passive mydriatics,

which, by themselves are powerless to produce dilatation. Adrenalin thus injected will overcome the miotic action of pilocarpine, but not that of eserine. The action of adrenalin used as an instillation on normal human beings is very slight—so much so that earlier observers considered it to have no action at all.

Adrenalin Poisoning.—J. Gerster¹⁰ was in the habit of using a cocaine solution to which one drop of a 1-1000 adrenalin solution for every c.c. had been added. Frequently there was observed severe headache, paleness, and increased pulse-rate. These disappeared when the concentration of adrenalin was reduced by three-fourths. The author collected 19 cases in which adrenalin was reported as the cause of death. In 9 there was a possibility of an associated chloroform poisoning, and in 4 cases cocaine had been given simultaneously. The author does not find that there are any authentic deaths from adrenalin poisoning in the literature.

The Action of Atropine.—S. Inouye¹¹ has studied the action of atropine in the human eye. He divided his experiments into two groups: (1) Those in which a higher concentration in divided doses ($\frac{1}{4}$ and $\frac{1}{8}$ per cent); and (2) Those in which a lower concentration ($\frac{1}{10}$ and $\frac{1}{20}$ per cent) was used. In both of these groups one drop of the stronger solution was dropped into the right eye every fifteen minutes, and one drop of the weaker solution was dropped into the left eye twice in fifteen minutes. Two drops of the weaker solution had a greater effect than one drop of the stronger solution in five out of six cases in Group 1, and in six out of eight cases in Group 2. This is attributed to the fact that the weaker dosage is less irritating to the eye, and is therefore more easily retained and absorbed. The contrary, however, was true in Japanese with dark irides, and the author suggests that this was probably due to lessened absorption because of the pigmentation.

The Action of Eserine.—S. Baba¹² found in his experiments, as Inouye did in the case of atropine, a more intense and enduring and less poisonous effect of eserine in broken doses than by a single total dose. A difference in absorption in persons with pigmented and light irides was not observed.

Prolonged Miosis for Control of Intra-ocular Tension: Preparation of Solutions of the Miotics.—G. E. de Schweinitz and B. F. Baer¹³ say that though they realize, in common with most ophthalmologists, that an early operation is the best method of treatment in the majority of cases of *chronic glaucoma*, in a certain percentage of cases operation does not check the process, and that sometimes degradation of vision is more rapid after a surgically correct procedure than prior to its performance, because increased intra-ocular tension is not the whole story of glaucoma. In some cases operation may be inadvisable for various reasons or it may be declined. Prolonged miosis without operation is capable of efficiency for a long time, and may be needed as an adjunct to operation. Eserine and Pilocarpine are therefore valuable agents in the treatment of glaucoma. Data are given of the methods of preparation of solutions of the miotics in order to avoid certain untoward complications which they may produce and which may preclude the possibility of their continued employment. A conspicuous and often most troublesome one is toxic conjunctivitis, characterized by the formation of follicular granulations and a moderate secretion, in many cases associated with oedema and eczematous eruption on the lids and surrounding tissues. It has been attributed to impurities in the solution, to the presence of free acid, to a fungoid growth, and to idiosyncrasy. Apparently it is more common in those patients who have an arthritic tendency. It is less likely to occur if pilocarpine hydrochloride or nitrate is used, than if any of the salts of eserine are employed in watery solutions, or if they and pilocarpine are both employed. Very dilute solutions should be used at first, and increased: $\frac{1}{10}$ gr. is recommended by Posey to start with. Solutions must

be fresh, often renewed, and sterilized. This is better than adding an antiseptic to the solution.

A well-known pharmaceutical chemist experimented on a patient whose conjunctiva quickly reacted to watery solutions of eserine and pilocarpine. He found the use of a special rose-water to dissolve the drug, instead of distilled water, averted the trouble in this patient. The formula is: Boric acid 18 gr. and stronger rose-water 4 fl. oz. Dissolve the boric acid in the stronger rose-water and filter into a sterile bottle. If the rose-water is cloudy from supersaturation of volatile oil, mix with purified talc before filtration. To filter, use a glass funnel, with a flattened plug of absorbent cotton in the neck, and upon this rest the folded filter-paper. Return the filtrate absolutely clear. He says that rose-water contains the alcohols geraniol and citronellol and esters of these. It seems to be slightly anæsthetic, however small the amount of oil may be. This solution can be further improved by adding 0.85 per cent of sodium chloride, making it a physiological salt solution in rose-water. The formula would be: Boric acid 18 gr., sodium chloride 16 gr., stronger rose-water 4 fl. oz. Prepare as directed above. The authors mention cases in which miotics have been used with success continuously, for periods running in one case to twenty years. [The point about sterilizing the drops is one worth carefully noting. It is obviously useless to do this unless a suitable drop-bottle be ordered or means taken to see that the dropper used is kept sterile. In actual practice this is apt not to be the case. As the whole comfort or even the preservation of the sight of the patient may depend on the ability to stand the prolonged use of a miotic, the matter is one of great importance to practitioners, who often have to supervise the treatment of these cases.—A. E. J. L.]

Reflex on Touching the Eyelashes of Comatose Patients.—B. Lemchen¹⁴ says that in functional diseases like hysteria, catatonia, and epilepsy, there is a movement of the lids similar to winking. In organic diseases such as cerebral hæmorrhage, severe trauma and paresis, no winking is produced. [This will be of interest to many and may prove useful to practitioners.—A. E. J. L.] †

Morphine and Scopolamine in Intra-ocular Operations.—J. Y. Malone¹⁵ finds morphine-scopolamine an excellent adjunct to local anæsthesia for intra-ocular operations. He gives two hypodermic injections, the first consisting of morphine $\frac{1}{4}$ gr. and scopolamine $\frac{1}{16}$ gr., one and a half hours before the time of operation; and the second of scopolamine $\frac{1}{4}$ gr., forty-five minutes later. It is of great value in children who are to be operated on for squint, but the dose must be carefully regulated by the age of the patient. [The reviewer has used scopolamine and morphia extensively in India, chiefly on Indian patients. He used one injection only, given usually three-quarters of an hour before operation. A large dose of potassium bromide was given also the last thing the night before and in the early morning. He used for adults the same amount of morphine but much less hyoscine. There is one chief drawback—that morphine is apt to cause Europeans to vomit. This rarely occurs in Indians. It may be serious in a cataract operation, but, in judging of the danger of this, the risk of an accident during the operation in the case of a badly behaved patient must be taken into account. In the reviewer's hands it was invaluable, and was used as a routine for many years. This was before the days of lid control by local injections, and cases which otherwise would have been very difficult to operate on were rendered quite easy. It proved very useful in lid operations in nervous women, employed in addition to a local injection of novocain. He suggests it would be easy to ascertain if a patient is susceptible to morphine by giving a test injection a few days previously.—A. E. J. L.]

Advantages and Disadvantages of Infiltration Anaesthesia.—The report of the Committee appointed by the Ophthalmological Section of the American Medical Association¹⁶ to consider this matter is generally favourable to it. It is suggested that the anæsthetic of choice should be **Procaine** in 1 or 2 per cent solution and never stronger than 4 per cent. Of the latter solution 2 c.c. is sufficient, although 4 c.c. has been injected many times without toxic effects. **Epinephrin** 1-100,000 or 1-200,000 (two drops of 1-1000 solution of epinephrin to 5 c.c. of procaine solution) should be added, alike for its ischæmic effect and to prevent absorption of the solution. The solution should be injected very slowly through a fine needle, and not less than ten minutes should elapse before beginning operation. Fifteen to thirty minutes may be allowed before beginning such operations as enucleation and advancement of ocular muscles.

The Frequency of Squint in American School Children.—S. D. Collins,¹⁷ in a report of the public health examination of 12,000 school children, says that 0.9 per cent had strabismus; four-fifths being convergent and one-fifth divergent. The percentage of children who have strabismus increases as the visual acuity decreases, even among those with approximately the same vision in both eyes.

Paralysis of Convergence after Influenza.—P. J. Hay¹⁸ reports a case in which paralysis of convergence occurred after influenza, with retention of the power of accommodation. The paralysis had not completely disappeared at the end of six months. [A number of eye troubles occur after influenza, and it is well for the practitioner to be aware of them. The reviewer has seen a case of transient diplopia, lasting a couple of hours according to the patient's statement, which occurred during convalescence after this disease. It gave rise, of course, to a suspicion of encephalitis lethargica, but a physician could not find any signs of this condition, and the other symptoms were those of influenza. On examination later the patient was found to have a well-marked refractive error, and apparently the strain of the close work he had been doing upset the muscle balance, the mechanism of which had been subjected to the toxin of influenza. It did not recur.—A. E. J. L.]

Etiology of Xerophthalmia.—T. Okamoto,¹⁹ by feeding rabbits with a mash of boiled beans filtered through linen cloth, was able to produce eye symptoms closely resembling human xerophthalmia. Sunlight or ultra-violet rays had no preventive action on the development of these symptoms. When fresh vegetables were given in addition to the special food the eye conditions did not develop, and the symptoms were also prevented by the ingestion of cod-liver oil. [This will interest workers in the East, where xerophthalmia is common. The reviewer's experience indicated deficient supply of milk and butter as playing a part in the causation of this condition, in some cases at least.—A. E. J. L.]

Relief of Pain in Herpes Zoster Ophthalmicus.—C. L. Davis²⁰ relieved the severe pain of this condition with an application of saturated **Cocaine** solution placed three days in succession in the uppermost anterior limit of the nose where the anterior ethmoidal nerve enters.

The Significance of Retinal Hæmorrhages.—R. Foster Moore²¹ discusses this subject very fully in a paper well worth reading. He mentions the modern views on the capillary circulation, and applies them to the explanation of the development of retinal hæmorrhages in morbid conditions. He says: "I suspect it is defective nutrition of the endothelium which determines the escape of the blood, and this I suggest is brought about by the abnormal constituents in the blood, as in nephritis or diabetes, or perhaps in the anæmias, by the defective nature of the blood itself." Dealing with the important matter of hæmorrhages in patients with a high systolic blood-pressure, for example in

renal disease, or primary arteriosclerosis, he says: "It is sometimes assumed that it is the increased pressure in the vessels which is directly responsible for the hæmorrhages". He believes that the pressure in the capillaries of such patients is not at all raised, but is frequently, and perhaps always, less than normal. The increased peripheral resistance which is responsible for the increased blood-pressure is in the small arteries. He does not believe that the retinal hæmorrhages of arteriosclerosis are caused by an increase of pressure in the arteries or capillaries; they occur only in cases which are somewhat advanced, and he suggests that the hæmorrhage is an expression of the defective circulation through the vessels, so that the nutrition of their endothelium is impaired and consequently a leakage of blood occurs. [This is a very practical matter. Sometimes the ophthalmologist is the first person to discover the existence of high blood-pressure in a patient who may present no other symptoms beyond the ocular condition. He hands over the patient usually to the physician for general treatment. The usual tendency is to cut down the nitrogenous portion of the diet somewhat drastically. If Foster Moore's contention is correct, great care should be taken to see that the patient is not under-nourished.—A. E. J. L.]

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FACE, INFECTIONS OF. (See also CAVERNOUS SINUS THROMBOSIS.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

TREATMENT.—The reviewer¹ has drawn attention to the danger of infections about the lips. He has been written to on several occasions by professional friends, recording experiences of dramatic fatalities from apparently simple infective lesions. J. W. Price, Jr.,² deals with the same subject. He says that infections of the nose, upper lip, and face differ from other infections inasmuch as there is increased danger of thrombophlebitis, embolism, cavernous-sinus thrombosis, meningitis, septicæmia, and pyæmia. He mentions that in the summer of 1917 a friend had a pimple on the nose. On Saturday morning he went to see a well-known specialist, who opened the pimple, and on the following Tuesday morning the patient died. The treatment of infections of the nose, upper lip, and upper part of the face may be outlined according to the degree of the infection. The infective process may be seen in three stages: (1) The initial lesion; (2) The period of extension; and (3) The period of thrombophlebitis, embolism, and septicæmia.

1. *First Stage*.—The initial lesion is usually confined to a hair follicle, sebaceous gland, or sweat gland. It appears circumscribed and superficial. The skin is red, slightly swollen, œdematous, hard, and tender, for twenty-four hours. During the following day a central point, the size of a pin-head, becomes necrotic and appears yellow beneath the epithelium. The treatment of this stage consists largely of 'don't's'. Don't squeeze; don't pick; don't cut. One should carry a bottle of alcohol in one's pocket and apply the alcohol

to the infected areas every hour, or a drop of mercurochrome may be applied two or three times a day. After another twenty-four hours the process is definitely localized in most cases. The necrotic area may be opened with safety. Alcohol or mercurochrome may be applied, and resolution occurs.

2. *Second Stage*.—This stage, the period of extension, develops when localization fails to occur, or, as is usually the case, after the infected area has attracted the patient's attention, and either he or his family physician squeeze, pick, or cut into it. Within twenty-four hours the infection invades the neighbouring hair follicles and glands. A carbuncle is developing. A wide area of surrounding tissue is swollen, oedematous, infiltrated. Pain is intense. If a lip is involved it becomes two or three times its normal size. The skin is purplish red. About the central necrotic focus the tissues are very hard and tender. If it has been opened there is almost no discharge. A small grey slough is visible. It seems to the writer that it is this condition which has led so many physicians into using a knife at once, and on finding no free pus to squeeze the tissues or to probe them. The early incision, squeezing, and probing not only fails to give relief but causes a further rapid spreading of the infection, and frequently results in a fatal thrombosis of the facial vein, or septicæmia.

The treatment of the second stage is, firstly, constitutional. The patient's powers of resistance should be reinforced by feeding. The local measures will ensure rest, sleep, drainage, and freedom from pain. During the first few days the one or more necrotic points are kept open, and compresses, saturated in 4 per cent salt solution, are applied every hour and kept constantly wet day and night by fresh salt solution being added to the gauze with a dropper every fifteen minutes. (The gauze is so small that it tends to dry in this time. Large gauze compresses are to be avoided because their weight interferes with the superficial circulation, and also because large compresses are painful.) The next step begins when the process has become localized and the process of liquefaction has advanced. This is recognized by a more abundant discharge. Now is the time when small multiple incisions may be made to connect the multiple openings toward the centre. Small bits of gauze are inserted to keep the skin edges apart, and to maintain drainage. The compresses are continued as before until healing has occurred. By this method of *delayed operative interference* we confine our incisions to the walled-off zone, and *we avoid cutting into veins which are not blocked*, and lessen the chief danger of a carbuncle of the nose, upper lip, or upper part of the face, namely, septicæmia or a thrombophlebitis and embolism of the facial vein.

3. *Third Stage*.—If the patient is seen for the first time in the third stage of the process, with thrombosis of the cavernous sinus, meningitis, or septicæmia, the case is, in all probability, hopeless. Nothing will be gained by multiple incisions, as has been illustrated in case reports of Martin and Kahn. If there is no cavernous-sinus thrombosis, but a septicæmia is present, the same local measures as described for *Stage 2* should be applied, and the usual methods for combating a septicæmia instituted. Intravenous injections of gentian-violet and mercurochrome have been suggested.

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FACTORY LEGISLATION.

Joseph Priestley, B.A., M.D., D.P.H.

Amending factory legislation is continually being suggested. Special political correspondents, who are supposed to be 'in the know', tell us one week that the Government is about to bring in its long-delayed Bill. This report is denied the following week, and the owners and occupiers of factories (and local authorities) breathe more easily—but only for a small respite. The report is

again repeated and again denied. So the game of shuttlecock and battledore goes on! That new amending and consolidating legislation is needed all experts will agree. The workers of to-day spend three-quarters of their waking days in factories, which, consequently, must be kept under strict control as regards ventilation, light, heating, and sanitary arrangements. It is not so much the new factories, which are designed and built up to modern requirements sanitarily, but the old (existing) factories that require special attention, the latter being often ill-designed and badly-situated from the points of view of light, heat, ventilation, and sanitary requirements. Fortunately, owners and occupiers are beginning to realize that the better the conditions under which the workers work, the better (and greater) the output. Money, therefore, expended on sanitary improvements is capital well expended and will return an increased interest-rate to all concerned—to the owners and occupiers financially, and to the workers hygienically.

The old Factory and Workshop Act is dated 1901, so that twenty-six years have elapsed, and this is a long period in the advance of sanitary ideas. An amending or consolidating or supplementary general Bill is, therefore, absolutely necessary. The only question is as to whether or not the present time is opportune. Will not the tendency to-day be to prune the Bill economically? If so, that will be bad for all concerned. However, the new Factory Bill, whenever it comes, will be welcome, as it promises improved (higher) standards for cleanliness, lighting, ventilation, and general personal hygiene and welfare of the workers (including 'first aid' attention as required to prevent sepsis in minor accidents, which may occur in factories).

Medical supervision in certain factories, and dental clinics in all, will be dealt with in the coming Bill—so, at least, it is reported—as will also the question of fatigue, and its prevention by simple methods of scientifically arranged shifts of work, etc. What is not yet reported is the officers who are to carry out and enforce these new improvements. It is clear that the Medical Officer of Health should not only retain his present sanitary control of workshops, but should also have complete sanitary control (through his sanitary inspectors) of factories, which are at present under the Factory Acts inspectors. This is an important change that might with advantage be introduced in any forthcoming new Factory Bill.

FIBROSIS, PULMONARY, IN CHILDREN. (See LUNG, CHRONIC NON-SPECIFIC INFECTION OF.)

FIBROSITIS. (See LUMBAGO.)

FILARIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

DISTRIBUTION.—The occurrence of filarial disease in the Kiang Su province of China, including the mouth of the Yangtse River, has been the subject of a brief inquiry by C. U. Lee,¹ who found considerable prevalence of the disease. He also identified *Culex pipiens* as a carrier as well as *C. fatigans*. In Nigeria J. H. Pasqual² has recorded a case of elephantiasis of the breast in a pregnant woman, which on removal weighed 42 lb. V. T. Korke³ records the results of an inquiry into the prevalence of filariasis in the Bihar and Orissa Province of India, the population of central jails being examined for embryos in their blood at night at Gava and Bhagulpur, as were the civil population in Gava Hospital. He found only *Filaria bancrofti*, and of 166 cases where the disease was suspected on clinical grounds 19 per cent showed the embryos. F. Connor⁴ has found relief to the symptoms given by intravenous injections of Soamin in bi-weekly doses of 1 to 3 gr. with a total of 12 gr.

N. A. Dyce Sharp⁵ has reported obtaining development of the *Microfilaria perstans* in the thoracic muscles of *Culicoides grahami* up to the stage of the sausage-shaped body, and the insects could not be kept alive long enough to trace the farther development. G. C. Low⁶ records finding Calabar swellings and other manifestations of *Filaria loa* in missionaries from the Welle river area of Belgian Congo, where the disease appears to be very prevalent.

Onchocerca volvulus.—An important addition to our knowledge of the life history of this widespread tropical African filaria has been made through the researches of D. B. Blacklock⁷ working in Sierra Leone. The adult worms live in subcutaneous nodules and give rise to larvæ, which reach the skin and are found in vast numbers by microscopical examinations, especially in that of the scapular region, loin, thigh, and ankle, the examination of which in 93 persons in an affected area showed infection of over 45 per cent. The larvæ are most readily found by cutting off small portions of skin with a razor and teasing in a drop of water to liberate them. The author found no greater prevalence of skin, eye, or gland affections in those showing the larvæ than in others, although affections of all three have been attributed to them. From 1923 to 1926 he has been working at the question of the transmission of the parasite by the common sand-fly of this region, the *Simulium damnosum*. The final proof that this filaria is carried by the *Simulium damnosum* is wanting, but it is highly probable that such will prove to be the case. These flies are found in humid shady places near water, and only bite in the shade. A similar if not identical disease is found in Guatemala, where the nodules are more frequently found on the head than on the body, but Blacklock found head nodules to be common also in some places in West Africa. A similar parasite causes great financial loss in Australia through forming nodules in the flesh of cattle, so this discovery may prove of value in that country.

REFERENCES.—¹*Trans. Roy. Soc. Trop. Med. and Hyg.* 1926, Nov., 279, ²*Ibid.* 1927, July, 89; ³*Ind. Jour. Med. Research*, 1927, Jan., 717, ⁴*Ind. Med. Gaz.* 1927, May, 239; ⁵*Trans. Roy. Soc. Trop. Med. and Hyg.* 1927, July, 70; ⁶*Ibid.* April, 514; ⁷*Brit. Med. Jour.* 1927, 1, 129.

FLAT-FOOT. (See FOOT, DEFORMITIES OF.)

FOOD, SUPERVISION AND HYGIENIC CONTROL OF.

William G. Savage, M.D., B.Sc.

During the last few years there has been considerable legislative activity in regard to the safeguarding of the purity of food. Milk has been separately dealt with (see MEDICAL ANNUAL, 1927, p. 312). The subject is complex, and full consideration would involve writing a treatise. All that is attempted here is a summary of the essential facts adequate to convey to the busy practitioner a general idea of the legal requirements.

CHEMICAL PRESERVATIVES IN FOODS.

The aggregation of large masses of the population in industrial cities, and the perishable nature of many foods, make food-preservation methods inevitable to a certain extent. Such methods include drying, preservation by heat in sealed containers (canning), smoking, and the use of chemical preservatives. To the use of the older preservatives, such as common salt, sugar, and vinegar, sanctioned by custom and without demonstrable ill-effect, no objection is raised; but the extensive use of active chemical poisons as preservatives, such as boric acid and its compounds, sulphites, salicylic acid, benzoic acid, and formaldehyde, has raised highly controversial problems. The Public Health (Preservatives, etc., in Food) Regulations 1925, which came into operation Jan. 1, 1927, form the administrative solution to the controversy. They take the sound view

(enunciated by the writer in 1919) that the only workable plan is to forbid the use of all preservatives in foods except those specified in the regulations, and these to be permitted only in scheduled foods and in maximum prescribed amounts. Additions or deletions can always be included in subsequent regulations. The original schedule giving the preservatives permitted, the foods in which allowed, and the maximum amounts, is set out in the MEDICAL ANNUAL, 1926, p. 190.

These regulations have been followed by amending regulations, of which the most important are the Public Health (Preservatives, etc., in Food) Amendment Regulations 1926, which also came into force Jan. 1, 1927. These apply only to certain specified foods, while they allow certain extensions of time as regards the presence of preservatives, in view of clearance of old stocks. They are set out in the MEDICAL ANNUAL, 1927, p. 403. A still more recent enactment is the Public Health (Preservatives, etc., in Food) Amendment Regulations 1927, dated June 25, 1927. They are not of great importance, but add lactic acid to the list of common permitted preservatives and do not prohibit sulphur dioxide under certain conditions.

The procedure adopted for enforcing the different regulations is, in the main, an extension of sampling under the Foods and Drugs Acts with much greater attention on the part of analysts to the detection and estimation of preservatives. Some concessions have had to be made as regards the presence of preservatives in old stocks, but it may be said that the prognostications as to disaster to the trades concerned and the great losses of food which would result, which were so freely raised, have not been fulfilled and little or no disturbance has been caused. This fact goes far to prove the contention of those who advocated these restrictions and prohibitions that in the great bulk of cases the addition of preservatives was unnecessary, and that the true alternative was a greater attention to initial purity and cleanliness at every stage. It was also said that the only alternative was cold treatment, and that a vast extension of refrigeration plant would be required. Facts are hardly yet available, but so far no extension of refrigeration on a very large scale seems to have been required or utilized.

Increased attention has had to be paid to methods for the detection and estimation of preservatives in foods, and two valuable reports may be mentioned by Monier-Williams on the determination of benzoic acid¹ and on the determination of sulphur dioxide² in foods. A point of interest is that it has been shown that minute quantities of preservatives are present naturally in a larger number of foodstuffs than was supposed. For example, minute quantities of boric acid occur in dried currants, sultanas, and raisins; formaldehyde in fresh herrings, egg-yolk, milk, etc.; benzoic acid in cranberries; and salicylic acid in certain fruits such as strawberries.

It has been suggested that the general banning of chemical preservatives will lead to the consumption of more food in the early stages of decomposition, with resultant ill-effects. There is no evidence that any increased consumption of such food is taking place, while evidence is wanting that it causes ill-effects. At the same time it is a point of interest, and evidence either way may come to the notice of the medical practitioner.

REFRIGERATION.

Undoubtedly the nearly complete suppression of the use of chemical preservatives will give a considerable impetus to the use of cold as a method of food preservation, though, as mentioned above, its effect so far has not been very perceptible. The general factors concerned in refrigeration are well known, but its bacteriology has been very imperfectly studied. Considerable

attention has been paid to this subject of late years, and some recent papers of interest may be mentioned.

A report³ of the Ministry of Agriculture and Fisheries shows the great increase in *refrigerated meat*. Frozen meat increased from 398,000 tons in 1909 to 700,000 tons in 1921 and declined to 486,000 tons in 1923, while chilled meat increased from 133,000 tons in 1909 to 381,000 tons in 1923. Chilled meat at present implies consumption within five to six weeks of killing. Other figures show a decline in the proportion of home-grown meat consumed between these two dates from about 54 to 48 per cent of the whole, and a proportionate increase of imported meat.

Clifford⁴ has shown, contrary to the assertion of many butchers, that short periods of cold storage, for example two to three days at 25° to 35° F., do not affect the appearance or quality of beef or mutton. Woods⁵ gives an interesting account of the transit and preservation of meat by chilling during transport from the Argentine. Very thorough cleanliness is necessary at every stage. One of the chief dangers to be avoided is the growth of moulds. The temperatures at which the consignments are to be carried range from 28° to 29° F. Very great care is necessary to cool gradually, and also to avoid freezing.

The actual freezing of meat causes considerably more physical change than chilling. Two valuable papers^{6, 7} from Australia give an account of these changes and steps to minimize them. The changes are largely determined by alterations in the sarcolemma of the muscle during freezing, and are shown by exudation from the cut surfaces after thawing. These are not reversible, so that there is a permanent change. The practical effect is an altered physical appearance and a greater rapidity of decomposition.

A report of the Food Investigation Board⁸ shows very deficient *ice treatment of fish*. A certain amount of ice is used for the fresh fish on the trawlers and on the quay, but it is employed in a very haphazard manner and but little appears to be known as to the amount of ice required. Direct experiments showed large variations in temperature from point to point. Refrigerator vans are by no means always used. An interesting chart gives the temperature fluctuations. This shows an average steady rise on the quay from the low temperature of the trawler to 80° F. or over. The rise is then checked by icing the fish, and the temperature gradually falls during transit to below 40° F. and rises again after the fish is distributed at Billingsgate or other centre. This, of course, enables the bacteria present at the time of landing to multiply enormously, and gives rise to early decomposition changes. To preserve fish the temperature must be kept *consistently* low.

Reports of the Food Investigation Board^{9, 10} contain interesting information in regard to the *action of cold on eggs*. On a commercial scale eggs are preserved almost universally by means of cold-air storage. This is at a temperature near, but not below, their freezing point. The main conditions for their successful cold-air storage are: cleanliness throughout, storage of only fresh eggs, preferably not more than a week old, very clean packing material and so arranged as to allow of free circulation of air, maintenance of a low and constant temperature (32° to 33° F.), constant humidity (80 per cent), circulation of air in the store, precautions when the eggs are removed from cold storage. The growth of moulds, mustiness, and changes in flavour are the three chief detrimental changes which occur in eggs, and the above conditions are necessary to prevent their development. It may be added that there is an extensive bacteriology on eggs, and that a considerable percentage of eggs are not sterile even when freshly laid. In certain diseases of fowls eggs are infected before they leave the oviduct.

Some of the above investigations are cited, not only from their special

interest, but to make it clear to medical men that refrigeration is largely a commercial problem. As a medical problem it may be said that the preservation of food by the application of cold adds nothing to the food and, if properly applied, does not give rise to any detrimental changes. It can therefore be accepted as the best food preservation method. As an industrial problem there are, however, many difficulties, such as the occurrence of physical changes which diminish the commercial value of the food. Much investigation is necessary to remove these and enable refrigeration methods to be more widely utilized.

MEAT SUPERVISION.

The supervision of meat in England labours under a heavy handicap. The Public Health Act 1875 recognized two classes of slaughter houses. *Registered* slaughter-houses are those in occupation before a certain date, *licensed* slaughter-houses those subsequently put up or adopted. This was an adaptation from an older Act (1847), but definitely perpetuated vested rights of the worst kind. Registration is compulsory, independent of the condition or situation, and such slaughter-houses have not the salutary check of periodical consideration which licensed houses, if licensed annually, are under. While registered slaughter-houses can be brought up to some inadequate kind of standard they cannot be closed so long as they are in continuous occupation. Their vested rights can only be extinguished by heavy compensation. It is this absurd and unnecessary position which is one of the main reasons why public slaughter-houses are so few. Accepted by all Public Health Experts as the only satisfactory way to ensure adequate supervision, their provision is again and again blocked by financial considerations.

In rural areas up to 1925, unless the Rural Sanitary Authority had obtained urban powers, there were no regulations as to slaughter-houses. The Rural District Councils' (Slaughter-houses) Order 1924 changed this, but most unfortunately perpetuated and introduced into rural areas the same undesirable division. Under this Order all places in use as a slaughter-house at the beginning of 1925, or at the earlier date of their urban powers, automatically became *registered* slaughter-houses on application, and only those erected or put into use for slaughtering after that date come under the *licensed* category.

All over England, both urban and rural, we have therefore a large number of isolated slaughter-houses of these two groups. One constitutes the registered slaughter-houses which do not come up for periodical review, and which are most difficult to close without compensation unless they are excessively bad. The other group are for the most part newer, better constructed, and in general in more suitable places. These are licensed, and the licence comes up, or should come up, for periodical review. The few public abattoirs come under the licensed group. In these most or all of the meat killing in the area is concentrated, and this concentration enables proper supervision to be exercised.

Although extensive powers for the examination of meat are given in various Public Health Acts, adequate *inspection at the time of slaughter* has never been practicable owing to the difficulty caused by the multiplication of scattered slaughter-houses. The Public Health (Meat) Regulations, 1924, which came into operation on April 1, 1925, are of great importance and go some way towards reducing this handicap. Also for the first time they make meat inspection a practical possibility in rural areas. They are administered by the local sanitary authorities. Concentrating upon essentials their main features are the following :—

Section 8 states : " A person shall not slaughter an animal for sale for human consumption unless he has not less than three hours before the time of slaughtering delivered or caused to be delivered to the Local Authority

notice of the day and time and of the place on and at which the slaughtering will take place."

As an alternative: "Where it is the regular practice in any slaughter-house to slaughter animals at fixed times on fixed days and written notice of this practice has been given to the Local Authority", special separate notices are not required. Also provision is made for emergency slaughter with subsequent notice. If any part of the animal slaughtered appears unsound it has to be reported. The Order also provides that the carcase and organs shall be retained for a reasonable time to allow of inspection.

An important general effect of these Regulations and the one on rural slaughter-houses is to make illegal the slaughter of any animals except on licensed or registered slaughter-house premises. A good deal of difficulty arose at one time as to occasional slaughtering by farmers, but a working compromise was effected allowing occasional but not regular slaughtering provided the three hours' notice is given under the Act.

Theoretically these provisions should allow the officers of the Local Authority to know of all slaughtering for human food, exactly when and where to inspect. In practice this does not occur, and the loophole of a fixed general notice permits much abuse.

Section 12 is particularly important, as it forbids all accessory food preparations in slaughter-houses. These include gut-scraping, tripe-cleaning, sausage-making, keeping meat during pickling, etc. There is considerable possibility of meat of this character being infected during slaughtering and dressing of carcases and so causing food-poisoning outbreaks.

Part III of the above Regulations deals with the marking of meat and enables local authorities to mark meat as an indication of inspection. Such meat marking is only permitted with the consent of the Ministry of Health and subject to proper arrangements for meat inspection by competent inspectors. Part IV deals with meat sold from stalls; Part V with the sale of meat from shops, including protection from flies and dust; while Part VI concerns transport and handling.

In spite of these valuable new powers, medical practitioners and the public generally should realize that unless there is a proper system of abattoirs, owned and controlled by the local authority and with an adequate and competent staff of meat inspectors, anything more than a partial and makeshift system of meat inspection is impracticable. Only a portion of the meat killed can be inspected, and there are many loopholes for evasion. In scattered rural areas with a single inspector, who combines in his single person as many functions as Pooh-Bah, and who often has no specialist knowledge of food inspection, it must remain profoundly inadequate. In urban districts it is not quite so bad, but as an illustration the case of Leicester may be quoted as given in a paper by the chief sanitary inspector.¹¹ In Leicester, with a population of nearly a quarter of a million in 1926, there were 48 private slaughter-houses, of which 47 were registered, and a group of 18 at the cattle market owned by the corporation. The position of these slaughter-houses was exceedingly unsatisfactory. For example, 14 adjoined dwelling-houses and formed part of the same building, while in 31 the slaughter-house opened directly into the yard of the dwelling-house.

CLEAN FOOD.

While this country is in the forefront as regards most phases of public health, it is comparatively backward in regard to the precautions it enforces to preserve the cleanliness of foods and prevent their acting as vehicles for the spread of infection. An interesting report on "Clean Food"¹² was issued in 1926,

compiled by a committee mainly composed of medical officers of health. The articles specially considered included milk, ice-cream, bread and confectionery, groceries, fruit and vegetables, fish, and imported foods, while contributors dealt with "premises where prepared food is made" and "restaurants and cafés". The report furnishes abundant evidence of want of even reasonable care and supervision and abundantly justifies the following conclusion: "The committee were greatly impressed by the fact that apparently Great Britain was practically alone amongst the more advanced of the nations in having failed to take cognizance of the existence of risk to health and of the production of disease as a result of defective and careless exposure and handling of food, and to provide legislation for the protection of the people from such risks."

The report itself should be consulted to see how numerous are the ways in which the different foods are exposed to bacterial contamination. The Committee considered the practice in this country of making regulations for each individual food (where any are made at all), and suggested the issue of one set of regulations containing provisions for such matters as are common to all foods, such as transport and, if possible, registration, and a general prohibition of exposure on the street of the more important and readily contaminated articles. Specific regulations could be made for any trade or article requiring them. The committee approved the policy of allowing local authorities to make by-laws and other local regulations in regard to food, subject to consent and oversight by the Ministry of Health. The need for more adequate supervision over the manufacture and care after preparation of made-up foods is especially urgent in view of their special relationship to outbreaks of food poisoning (*see* MEDICAL ANNUAL, 1926, p. 181, 'Food Poisoning').

A phase of the clean-food problem of more intimate concern to medical practitioners is the extent to which persons suffering from communicable diseases come in contact with food, and any evidence that disease is spread in this manner. Apart from regulations specifically related to milk, the legal powers to prevent contamination of food by persons suffering from communicable diseases such as syphilis or tuberculosis or for carriers of infective bacilli are of the scantiest. The most useful is under the Dysentery and Enteric Fever Regulations, which enact that any person suffering from these complaints or suspected to be a 'carrier' may be prohibited from any occupation connected with the preparation or handling of food or drink for human consumption, and power is given to make a clinical examination of suspected persons.

There is no power to investigate the general health of persons whose occupations involve food handling, such as workers in restaurants, cafés, or food-producing shops. This side of the question has received considerable attention in a number of cities in the U.S.A., and special ordinances to enable this to be done are in force in a good many cities. In Newark, New Jersey, for example, this work has been carried on since 1920. It was started with restaurant employees, and has since been gradually extended to include grocers, confectioners, delicatessen workers, and milk handlers. A summary of the results is given by M. J. Fine,¹³ of the Health Department of that city:—

SUMMARY, 1920-25.

Restaurant employees examined by Health Department	29,369
" " " outside	2,819
Milk "dealers examined by Health Department	6,877
" " " private physicians	2,992
Re-examinations	3,822
Rejections for tuberculosis by Health Department . .	153
" " venereal disease by "	45
Temporary permissive cards issued for 1925	14
" " " " " 1926	81

Information is not given as to the extent to which other communicable infections, for example, septic sores, are dealt with, if at all. An interesting point in connection with this work is that it is found that each year the infections are less and less, because persons with tuberculosis or venereal disease know that no cards for employment will be issued unless they are free from communicable diseases, and therefore they secure other occupations.

The available facts support the view that there is a decided need for increased control over the places where foods are prepared for consumption, and that some degree of medical supervision is necessary with regard to those who actually handle foods in restaurants, hotels, etc.

REFERENCES.—¹*Ministry of Health, Reports on Public Health and Med. Subjects*, 1927, No. 39; ²*Ibid.* No. 43; ³*Ministry of Agriculture and Fisheries, Econ. Series*, 1925, No. 6, Report on the Trade in Refrigerated Beef, Mutton, and Lamb; ⁴*Biochem. Jour.* 1925, xix, 998; ⁵*Jour. Roy. San. Inst.* xlvii, 336; ⁶G. A. Cook, E. F. J. Love, J. R. Vickery, and W. J. Young, *Australian Jour. of Exper. Biol. and Med. Sci.* 1926, iii, 15; ⁷Vickery, J. R., *Ibid.* 81; ⁸*Dept. of Sci. and Indust. Research, Food Investigation Board, Special Report*, No. 25; ⁹*Ibid.* Report for the Year 1924; ¹⁰*Ibid.* Special Report, 1926, No. 26; ¹¹F. G. McHugh, *Jour. Roy. San. Inst.* 1927, xlvii, 537; ¹²*Clean Food, Roy. San. Inst.* publication, 1926, Feb.; ¹³*Medical Officer*, 1927, May 28, 247.

FOOT, DEFORMITIES OF.

E. W. Hey Groves, M.S., F.R.C.S.

In spite of all that has been done and written about this subject, it is generally recognized that the treatment of the deformities of the foot presents many difficulties, both theoretical and practical.

Congenital Talipes Equinovarus.—L. Ombrédanne¹ has contributed a useful article in which he indicates the reason and method for various types of operation on the common form of congenital talipes equinovarus. He begins by dividing the cases according to their age and the condition of the deformity,

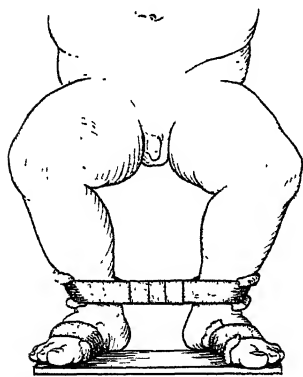


Fig. 23.—Brant's method in treatment of club-foot. (Re-drawn from the 'Zentralblatt für Chirurgie'.)

into those of complete reducibility, those of relative reducibility, and those of complete irreducibility. In the first period, when the foot can be fully corrected or over-corrected, there is, of course, no indication for operation; manipulation, splinting, and massage have to be continued for one or two years, and in some cases even as late as the eighth year. In the later period, when reduction cannot be made except with considerable force, he thinks that division of certain tendons and ligaments will greatly facilitate correction by manipulation and splinting. It is the late stage, of complete irreducibility, in which definite operations upon the bones of the foot are indicated; he condemns very strongly the blind surgery by which ligaments are torn and bones crushed by wrenches. He divides the useful types of operations into three categories: (1) *Peri-astragaloid excisions*; (2) *Astragalectomy*; (3) *Cuneiform tarsectomy*.

In the first of these groups of operations an attempt is made to enlarge the bony bed in which the astragalus lies, so that this keystone of the tarsal arch can be rotated into correct position. This may involve an enlargement of the tibiofibular mortice, a resection of the calcaneo-astragaloid joint, and removal of the head of the astragalus itself. The author rightly considers that this procedure is unsatisfactory, because it is complicated and because it interferes with the ankle-joint itself. In regard to the second type

of procedure, astragalectomy, the operation consists in removal of the astragalus and a pushing of the foot backwards so that the leg bones come to articulate with the mid-tarsal region. The great advantage of this operation, which is promoted with the great authority of Whitman, is its simplicity. Ombredanne,

Fig. 24.—Dickson and Diveley's operation for claw-foot. Normal relationship of the tendons to be transplanted. There is a paralysis of the flexor tendon of the great toe with compensatory overaction of the extensor. A, Extensor proprius hallucis; B, Extensor brevis hallucis; C, Flexor longus hallucis. (Figs. 21-26 re-drawn from the 'Journal of the American Medical Association'.)

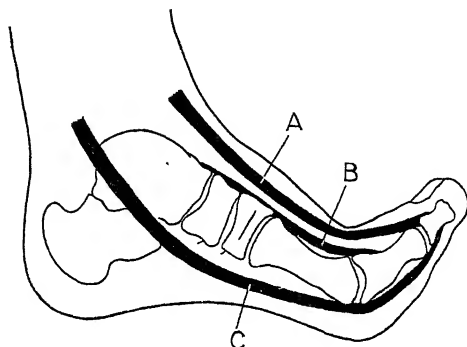


Fig. 25.—Dickson and Diveley's operation for claw-foot. Relationship of the transplanted extensor proprius hallucis; how the great toe is flexed by the taut flexor tendon. A, Extensor proprius hallucis; B, Extensor brevis hallucis; C, Flexor longus hallucis.

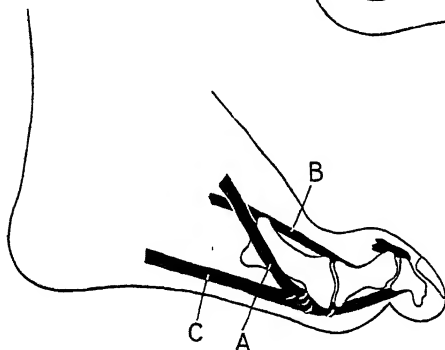
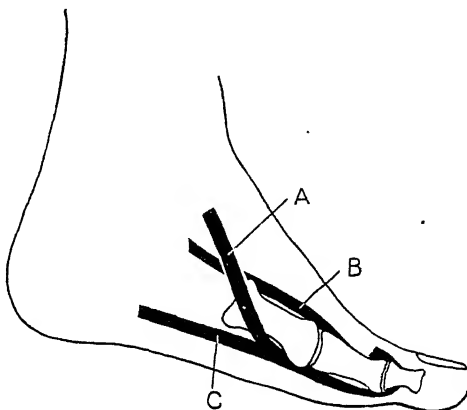


Fig. 26.—Dickson and Diveley's operation for claw-foot. Relationship after the interphalangeal arthrodesis. A, Extensor proprius hallucis; B, Extensor brevis hallucis; C, Flexor longus hallucis.



however, does not entirely approve of it, because it is not an effective correction of the inward twist of the foot. The operation which he does favour consists in a double cuneiform tarsectomy. This is done on the outer side of the foot; one wedge is cut out from the length of the foot, the removal of which cures

adduction, the other is cut from the joint between the astragalus and the calcaneum so as to correct the inversion of the foot. Finally, there are certain cases in which, when all other elements of the deformity have been corrected, there remains an internal rotation of the foot which he considers can only be corrected by an *osteotomy of the lower end of the tibia*. He divides the tibia transversely just above the tibiofibular junction by means of a Gigli saw, and fixes the bone in corrected position by means of plate and screws. The majority of surgeons would consider that the latter method of fixation was unnecessary.

In regard to the treatment of club-feet in infancy the theory is very simple, but the practice very difficult. It involves manipulation of the feet several times a day, and a fixation by means of splints for months or years. It is exceedingly difficult to find any splint which controls the tiny foot of a baby that can be easily taken off and on. Plaster-of-Paris will not remain in place unless it is carried above the bent knee. Brandt² has suggested a very simple device to meet these difficulties. This is best understood by reference to *Fig. 23*. It consists of a flat padded splint to which the soles of both feet are strapped so as to correct the inversion. A strip of adhesive plaster is passed from leg to leg above the ankle in such a manner as to correct the adduction of the foot and the internal rotation of the leg.

Claw-foot.—In minor degrees of this deformity, due to infantile paralysis, the procedure in common vogue is to transplant the tendon of the extensor longus hallucis from its attachment to the terminal phalanx to the neck of the first metatarsal. F. D. Dickson and R. L. Diveley³ consider that this procedure does not give uniformly satisfactory results. They suggest the following modifications. The tendon of the extensor longus hallucis is transplanted into that of the flexor longus hallucis, by which device it is made to lift the great toe and also to assist in flexion; and further, where a marked hammer-toe exists, the joint between the first and second phalanges is resected. (*Figs. 24–26.*)

Flat-foot.—O. L. Miller¹ considers that there are certain cases of flat-foot in adolescents which resist the ordinary methods of treatment by exercises and braces or which relapse after such treatment. He has devised an operation for these conditions which is both simple in its methods and sound in its principles. The inner margin of the foot is exposed by a long incision extending from the tip of the inner malleolus to the base of the first metatarsal. An osteoperiosteal flap is raised from the underlying bones, taking portions of the internal cuneiform and scaphoid. A wedge-shaped resection is made of the joints between the metatarsal and cuneiform, and also between the cuneiform and scaphoid, and of the neck of the astragalus. The arch of the foot is then over-corrected, and whilst held in this position the osteoperiosteal flap is brought forward and fixed to the base of the first metatarsal. (*Plate XI'III.*)

REFERENCES.—¹*Jour. Bone and Joint Surg.* 1927, April, 315; ²*Zentralbl. f. Chir.* 1927, March 12, 645; ³*Jour. Amer. Med. Assoc.* 1926, Oct. 16, 1275; ⁴*Jour. Bone and Joint Surg.* 1927, Jan., 84.

FOREIGN BODIES IN THE EAR AND NOSE. (*See* EAR, FOREIGN BODIES IN; NOSE, FOREIGN BODIES IN.)

FUNGUS INFECTIONS OF THE SKIN. (*See* SKIN, FUNGUS INFECTIONS OF.)

FURUNCULOSIS. (*See* FACE, INFECTIONS OF; SKIN, STAPHYLOCOCCAL INFECTIONS OF.)

PLATE XVIII

PLASTIC OPERATION FOR FLAT-FOOT

(O. L. MILLER)

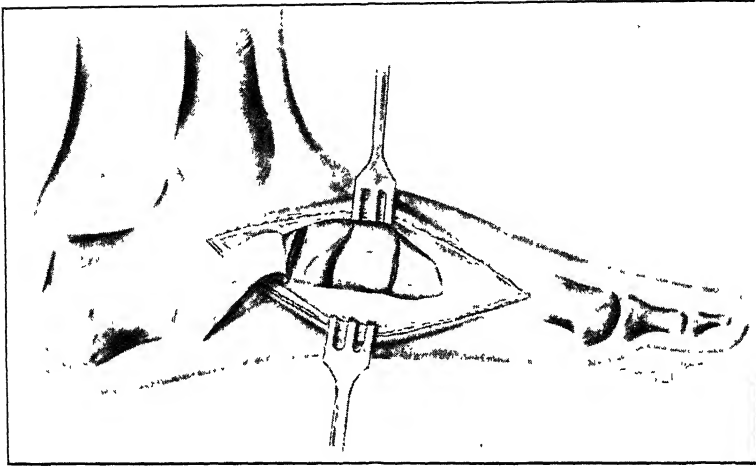


Fig. A.—Showing section from neck of astragalus. This can be done through the incision when necessary.

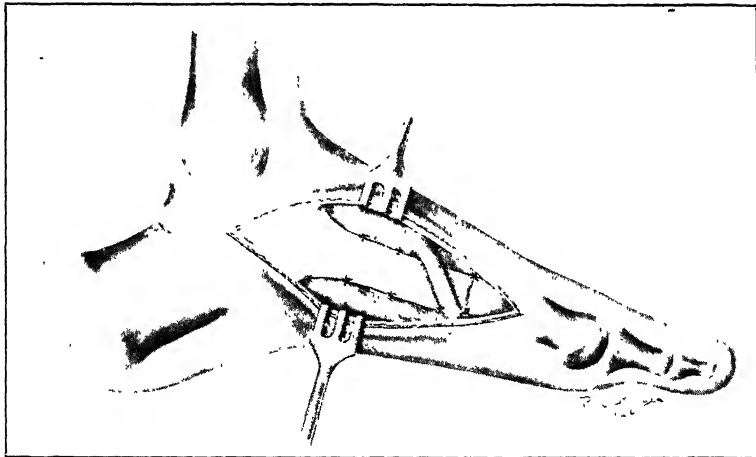


Fig. B.—Showing the fascia sutured in place, maintaining a normal arch line.

GALL-BLADDER, SURGERY OF.*A. Rendle Short, M.D., F.R.C.S.*

Origin of Gall-stones.—The question is still being actively debated as to the relative parts taken in the formation of gall-stones by infection of the bile-passages and increase of cholesterol in the blood. Two researches have appeared bearing on the subject, the one from the clinic of Sir Berkeley Moynihan and the other from the Mayo Clinic. F. S. Fowweather and G. A. Collinson¹ have carried out analyses of the blood, the bile, the wall of the gall-bladder, and the stones in cases operated on by Moynihan. They found: Blood cholesterol raised, 46.7 per cent cases; bile cholesterol raised, 44 per cent; gall-bladder cholesterol raised, 45.5 per cent; blood calcium raised, 32.8 per cent; bile calcium raised, 6.7 per cent; bile calcium reduced, 17.8 per cent; gall-bladder calcium raised, 44.9 per cent. They found that as a rule the blood cholesterol is raised during the acute stage of gall-bladder disease, but falls later. This may explain the conflicting results of other workers. After cholecystectomy, if the blood cholesterol had been elevated, it falls to normal in the course of months. The explanation offered is that the gall-bladder can and does absorb cholesterol and other substances; that the first stage is stagnation of bile in the gall-bladder owing to inflammatory swelling of the cystic duct or increase of abdominal pressure (e.g., pregnancy). This causes increased concentration of cholesterol, increased absorption, and so a raised percentage in the blood. Much higher figures for blood-cholesterol are obtained in patients with diabetes during strict dieting; yet they are not specially liable to gall-stones, so it is not probable that gall-stone formation is merely due to hypercholesterinæmia. Nor would removal of the gall-bladder alter an innate tendency to an increase of cholesterol in the blood. When the bile retained in the gall-bladder has been concentrated sufficiently, a shower of cholesterol crystals comes down, and stones form or increase. [The reviewer has for long felt confident that this is the correct explanation. It must not be forgotten that many epithelial surfaces, e.g., middle ear, dental cysts, hydroceles, can deposit cholesterol when inflamed. It is unreasonable to suppose that stones in the gall-bladder are due to a totally different process, viz., hypercholesterinæmia.—A. R. S.]

E. S. Judd, S. H. Mentzer, and E. Parkhill² add to our knowledge of gall-bladder infections. In 200 cases operated on, in spite of the fact that usually the surgical procedure was undertaken during a quiet interval, 49 per cent of the gall-bladders removed showed germs, usually a streptococcus. Only in 14 per cent of cases was the bile infected, because, as they show, concentrated bile inhibits bacterial growth. The streptococcus found produced lesions of the gall-bladder or infections of the bile in 75 per cent of animals injected. Fowweather and Collinson,¹ in 66 cases examined, found germs in the bile 23 times and in the gall-bladder 27 times.

Liver Function Tests.—W. R. Laird, B. F. Brugh, and W. V. Wilkerson³ advance evidence, derived from a study of 52 consecutive cases of gall-bladder disease on whom accurate tests were carried through, that the digestive disturbances, etc., run parallel with the liver-function reactions, and are due more to the hepatic disturbance than to the gall-bladder infection. The methods used were the phenoltetrachlorophthalein, van den Bergh, urinary urobilin, and Widal's hæmoclastic crisis values.

Franklin Carter⁴ points out that the patient operated on for gall-stones may suffer afterwards either from acidosis, or from the more dangerous and insidious condition of alkalosis. He therefore advises regular examination of the carbon dioxide of the blood (alkali reserve). The former is combated by glucose and intravenous saline. One must not give bicarbonate indiscriminately, or a fatal alkalosis may be induced. The patient with alkalosis is in a state of

'quiet tension or twitching somnolence'. The limbs are held stiff. Large quantities of HCl will usually save them. Carter gives 15 drops every two hours, in much water, and 20 drops, freely diluted, per rectum every three hours. Infusions of glucose and saline are contra-indicated.

Operative Technique.—V. Schmieden,⁵ discussing the indications for operation in cases of jaundice due to gall-stone impaction, lays down the rules that it is not likely to clear up if it has lasted without intermission for fourteen days; that in the presence of septic fever and rigors due to cholangitis one should not wait more than two or three days, and when the jaundice comes and goes, three or four weeks is a reasonable period of probation.

H. B. Devine,⁶ of Melbourne, insists on the importance of avoiding dragging on the liver in gall-bladder surgery, which is likely to give rise to nausea for days afterwards; also to secure accurate hæmostasis throughout, and avert post-operative adhesions by tender handling, and the avoidance of imperfect

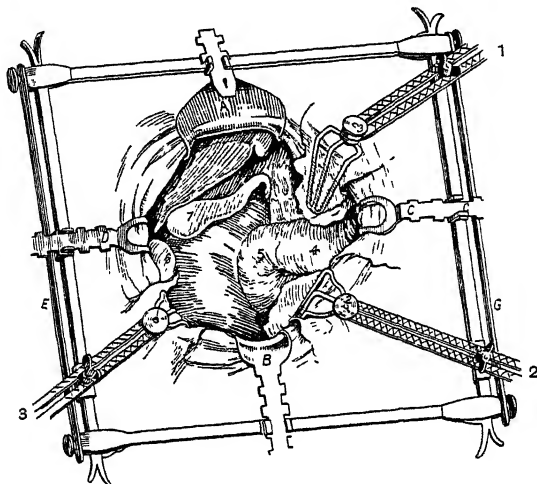


FIG 27.—Drawing showing the 'setting' of the operation by means of the universal self-retaining retractor as a preparation for cholecystectomy. The wound edges are covered; the intestine, stomach, and colon are secluded from the field of operation; the duodenum is drawn downward, stretching the gastrohepatic ligament. 1, 2, 3, Mechanical hands; 5, Duodenum; 6, Hepatic flexure; 7, Gall-bladder (Re-drawn from 'Surgery, Gynecology and Obstetrics'.)

peritoneal co-adaptation and too prolonged drainage. As soon as the incision has been made and the retractors have been inserted, the ether anaesthesia should be extremely light. He uses a paramedian incision, and the special retractor with 'mechanical hands,' shown in Fig. 27. It is better to make a somewhat smaller incision than usual in order to get the spring-like action of the muscle which retains the retractor in position. If there are no adhesions to the abdominal wall from a previous operation, proceed as follows: Two very thick towels are laid over the wound so that they overlap at the lower angle of the wound. The frame is laid on these, and, with a left forefinger placed on the towel at this point, the towel junction is tucked under the cut edge of the abdominal wall. Blade B is now substituted for the finger and held up by the left hand of the assistant so as to elevate the abdominal wall clear of viscera and thus enable the left hand of the operator at C to tuck in the towel at this point under the peritoneum, and unhampered by intestines

to insert blade **C** and to lock it on the frame. The assistant, with his right hand, pulls the frame toward him and keeps it on tension at the point **E** while still retaining the upward tension on the blade **B**. This facilitates insertion and locking of the blade **D** so that the wound is widely opened under slight tension. The assistant, with his hands at **E** and **G**, now lifts the frame and so allows the towel to be turned under the peritoneum in the upper angle, and the insertion of the blade **A**. The wound is now opened to its fullest extent, under slight tension only, and the wound edges, including peritoneum, are completely covered without any fear of disarrangement, damage, or infection. If the stomach is distended, empty it with a trocar, and close the puncture with a suture. It will be observed that gauze scarves

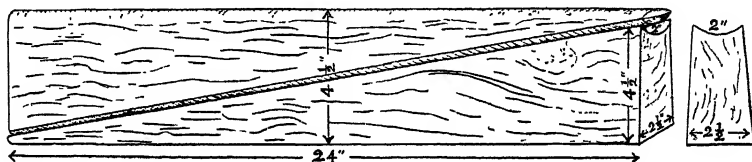


Fig. 28.—Grey Turner's wedge for securing the Mayo Robson position in gall-bladder surgery. (Figs. 28, 29, kindly lent by the 'Lancet'.)

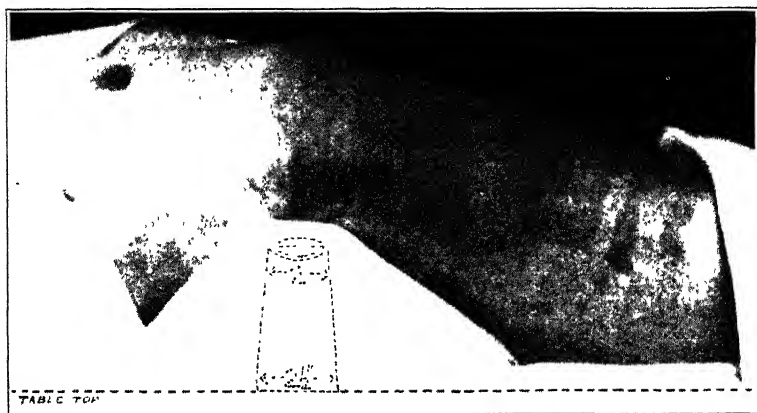


Fig. 29.—Grey Turner's wedge applied.

are placed beneath the blades of the retractor. When good access has been obtained, commence by making an incision along the peritoneum over the line of the cystic duct and the common bile-duct, and prolong it up the gall-bladder. Then enucleate and tie the cystic duct, and proceed to remove the gall-bladder by dissecting along its serous plane. If the cystic duct is dilated, remove the ligature on it, and pass a probe down both ducts. If the patient has no jaundice and no stone can be palpated, it is not necessary to incise or probe the ducts.

Grey Turner' advises the use of a pair of wooden wedges to secure the Mayo Robson position in gall-bladder surgery (Figs. 28, 29). One is pushed in from each side of the table. They elevate the back $4\frac{1}{2}$ in.; it obviates any lifting.

It will be noticed that the lower wedge is grooved above, to fit the slightly rounded surface of the upper wedge. W. J. Mayo,⁸ following McArthur, leaves the posterior aponeurosis of the rectus muscle and the peritoneum uncut in the lower quarter of the incision, to prevent subsequent hernia in that situation.

Crile⁹ has developed his anoci-association methods and applied them to the surgery of the common bile-duct. He says that the shock and general upset after removing a stone from the common bile-duct may be averted by a wide regional block with novocain and splanchnic anaesthesia, a sharp feather-edge dissection with an ultra-sharp knife, a bloodless field kept so by a suction apparatus, and avoidance of direct drainage of the common duct. It is well known that sudden reduction of pressure in the bladder is disastrous to the kidney; the same is true for the liver when there has been back-pressure of bile. Therefore he closes the bile-duct, and drains Morrison's pouch by a postero-lateral drain, to avoid adhesions. The temperature of the liver is maintained by a diathermy apparatus, one plate being placed on the liver and the other over the chest wall.

W. A. Steel¹⁰ reports 100 cases of infected gall-bladder treated by cholecystoduodenostomy or cholecystgastrostomy. He believes it is more efficient than temporary external drainage, and not so severe as cholecystectomy. Two patients out of 100 died. Of 78 followed up, 12 had died of intercurrent diseases, and two of cancer of the bile-passages. Of 64 living, 50 were well, 8 better, and 6 still getting dyspeptic symptoms. In no cases had jaundice recurred. The cases were all operated four to eight years ago. In a second series, however, 3 patients died of acute or subacute pancreatitis.

Rost¹¹ warns against sewing up the bile-duct and dilating the papilla of Vater to provide internal drainage in patients with stone in the common duct. One case of his treated in this way promptly died of acute hæmorrhagic pancreatitis from injection of the pancreatic duct with bile in consequence of inflammatory swelling of the papilla of Vater. This might, of course, be guarded against by using the technique described in the *MEDICAL ANNUAL* for 1927 (p. 188).

The Risks of Gall-bladder Surgery.—H. W. Cave¹² presents a study of 470 cholecystectomies, with 30 deaths (6·3 per cent), and 105 cholecystostomies, with 5 deaths (5 per cent). The practice followed was to prefer drainage in the acutely infected cases. In 54 of the 470 cases the common duct was opened. The causes of death are analysed. Four died of hæmorrhage, 4 of pulmonary embolism, 7 of post-operative pneumonia, 4 of peritonitis. Three cases were mysterious, with high fever, coma, and death. They are attributed to liver toxæmia.

Rendle Short and Fraser¹³ also present a study of 20 deaths, seen in the course of ten years in the practice of several surgeons, following operation for gall-bladder trouble. Of these, 3 were pulmonary deaths, 1 due to hæmorrhage, 6 were attributed to liver toxæmia, and of 5 others, supposed to be due to shock, some were probably liver deaths. The lesson is to avoid as far as possible operating on persons in a state of liver toxæmia, i.e., during the later stages of an acute attack. If something must be done, let it be as little as may be, and under a local anaesthetic.

Very similar conclusions may be drawn from a further series of mortality studies in the Mayo Clinic, described by E. S. Judd and B. R. Parker.¹⁴ Full details are given of 38 fatal cases. They stress the value of high carbohydrate feeding and of calcium chloride injection, or in bad cases blood transfusion, in preparing patients for operation. Adequate drainage is imperative.

End-results and Later Complications in Gall-bladder Surgery.—Several clinics have been doing valuable work by a careful follow-up of their gall-bladder cases. We may notice three—J. B. Deaver and E. L. Bortz¹⁵ of Philadelphia,

J. M. Hitzrot and N. W. Cornell,¹⁶ of New York, and E. L. Eliason and L. K. Ferguson¹⁷ of another hospital in Philadelphia. Deaver and his colleague report on 903 cases, some of calculous cystitis, some of non-calculous. The follow-up includes cases operated from one to three years previously. The usual treatment was removal of the gall-bladder. There were 27 patients with obstruction of the common duct.

	CALCULOUS CHOLECYSTITIS		NON-CALCULOUS CHOLECYSTITIS	
	No.	Per cent	No.	Per cent
Condition entirely relieved ..	289	= 64.10	266	= 65.50
Condition improved ..	59	= 13.10	72	= 17.50
Condition unimproved ..	17	= 3.80	34	= 8.25
Deaths (uncomplicated cases) ..	24	= 5.34	12	= 2.91
Deaths (complicated cases) (including post-operative cases) .	30	= 6.68	12	= 2.91

Hitzrot and Cornell write: During the period given below, 482 cases of gall-bladder disease have been submitted to surgical treatment. Of these 482 cases, 400 cases were submitted to cholecystectomy and 82 to cholecystostomy. Results:—

CHOLECYSTECTOMY			CHOLECYSTOSTOMY		
Excellent ..	Cases	203 = 50.75 per cent	Cases	32 = 39.02 per cent	
Satisfactory ..	"	112 = 28.00 " "	"	20 = 24.39 " "	
Unsatisfactory ..	"	30 = 7.50 " "	"	13 = 15.85 " "	
Dead ..	"	39 = 9.75 " "	"	13 = 15.85 " "	
Not found ..	"	16 = 4.00 " "	"	4 = 4.87 " "	
400 = 100 per cent			82 = 99.98 per cent		

Better results were obtained when stones were present than in non-calculous cholecystitis. There were 35 cases of common-duct stone, with 28 excellent results.

Eliason and Ferguson deal with 136 cases, of which 6 per cent were lost sight of. Of the cases of *acute cholecystitis*, 89 per cent have been cured by cholecystectomy with an operative mortality of 10 per cent; by cholecystostomy, 76.4 per cent have been relieved of all symptoms, with an operative mortality of 4.3 per cent. Combined—6 per cent. Of the cases of *chronic cholecystitis*, 87.5 per cent of the patients who had a cholecystectomy were cured, with an operative mortality of 4.1 per cent; cholecystostomy resulted in no mortality, and 72 per cent of the patients were relieved. Combined—2.5 per cent. The operative mortality of the combined acute and chronic infections of the gall-bladder unassociated with other lesions was 3.6 per cent. Of the patients operated on for biliary obstruction, 77 per cent were relieved. The operative mortality was 23 per cent.

The general conclusion is that modern surgery of the gall-bladder gives satisfactory results in from 70 to 80 per cent of the cases operated on. With this the reviewer's experience agrees. Very few cases nowadays are entirely unrelieved.

An interesting study is offered by R. G. Spurling and L. R. Whitaker,¹⁸ who have obtained cholecystograms in twelve patients at intervals after cholecystostomy. Not one of them showed a normally functioning gall-bladder. If the mucosa had been severely damaged, the absorbing power was insufficient to give a good shadow. If the muscle was involved, the gall-bladder did not empty properly after a fatty meal.

Post-operative Stricture of the Bile-ducts.—J. Douglas¹⁹ remarks that while there are many reports in the literature of somebody's method of repairing a damaged common bile-duct or hepatic duct, there are very few published end-results. He has examined 12 cases treated some time before at St. Louis Hospital, New York. Suture of the ducts gives the best results, and, next

to this, direct hepaticoduodenostomy. Tube methods are less successful. Of the 12 patients, 5 were cured, though 3 needed two operations, another recurred, and 6 died after longer or shorter periods. E. S. Judd²⁰ writes on the same subject. He comments on the fact that the patient may have been well for months before the symptoms of stricture for some mysterious reason make their appearance. Presumably they are due to an obliterative inflammatory process. He advises making an opening from the hepatic duct into the duodenum, over a tube. Unfortunately the trouble may recur. A second intervention may be successful.

The Stoneless Gall-bladder.—As is well known, patients operated on in the expectation of finding gall-stones, but showing only cholecystitis, do not do as well as those in whom gall-stones are found and removed. E. M. Stanton²¹ reports 44 cases followed a year or more. Of these, 31 (71 per cent) were well, and 13 unsatisfactory; but in several of those described as well the diagnosis had been erroneous. Twelve cases subsequently proved to be suffering from something else. Four were cardiac, two pancreatic cancer; others were functional, visceroptosis, etc.

Cancer of the Bile-passages.—Ewald Fulde²² reviews the literature (nearly all German) dealing with the results of operation for cancer of the common bile-duct or of the ampulla of Vater. In 47 cases the treatment was a one-stage removal, usually transduodenal extirpation; 20 died and 27 recovered. There were 13 two-stage operations, taking various forms; sometimes the gall-bladder was drained, or a cholecystoduodenostomy performed at the first stage and the growth removed later. Most of the growths affected the common duct. Thirteen recovered and 7 died. End-results are not given, but a few are known to be well some years afterwards.

REFERENCES.—¹*Erit. Jour. Surg.* 1927, xiv, April, 583; ²*Amer. Jour. Med. Sci.* 1927, Jan., 16; ³*Ann. of Surg.* 1926, Nov., 703; ⁴*Ibid.* 1927, April, 555; ⁵*Munch. med. Woch.* 1926, Nov., 1891; ⁶*Surg. Gynecol. and Obst.* 1927, Jan., 85; ⁷*Lancet*, 1926, ii, 224; ⁸*Surg. Gynecol. and Obst.* 1926, July, 46; ⁹*Ann. of Surg.*, 1926, Sept., 411; ¹⁰*Surg. Gynecol. and Obst.* 1927, March, 393; ¹¹*Zentralb. f. Chir.* 1927, Jan., 20; ¹²*Ann. of Surg.* 1926, Sept., 371; ¹³*Brit. Med. Jour.* 1927, i, 1001; ¹⁴*Ann. of Surg.* 1926, Sept., 419; ¹⁵*Jour. Amer. Med. Assoc.* 1927, Feb. 26, 619; ¹⁶*Ann. of Surg.* 1926, Dec., 829; ¹⁷*Ibid.* 1927, April, 565; ¹⁸*Surg. Gynecol. and Obst.* 1927, April, 463; ¹⁹*Ann. of Surg.* 1926, Sept., 392; ²⁰*Ibid.* 404; ²¹*Jour. Amer. Med. Assoc.* 1926, Dec. 25, 2160; ²²*Zentralb. f. Chir.* 1927, June, 1481.

GASSERIAN GANGLION, TUMOURS OF. *Geoffrey Jefferson, M.S., F.R.C.S.*

Tumours of the Gasserian ganglion are of more than ordinary interest to the clinician, and a relatively small number have been described. They may occur in the form of meningiomas growing from the sheath of the ganglion, or much more rarely as true gliomata, although the authenticity of this exceedingly infrequent type has been questioned. The commonest involvement is by the extension of a carcinomatous process in the pharynx or nose along the second and third divisions whereby the cells enter the skull. The cases are of considerable importance, because trigeminal pain not distinguishable from ordinary trigeminal neuralgia is frequently the only feature. Careful examination usually reveals the presence of anæsthesia (anæsthesia dolorosa), which is never present in tic douloureux. New and H. W. Woltman¹ published a series of naso-pharyngeal tumours with fifth nerve involvement and have done much to enlarge the subject. Gjertz and Hellerstroem² report a case in which at necropsy a tumour of the Gasserian ganglion with extension into the posterior fossa was discovered. Histologically the growth was a neurofibroma, and as the patient had a seventh and eighth nerve palsy in addition it is not entirely clear what the exact starting-point was, but from the account it seems that it was not of acoustic origin.

Max Peet² has met with two examples of the second variety of tumour in which trigeminal pain preceded the appearance of a primary growth. In the first case a maxillary carcinoma was not discovered until several weeks after operation although its presence had been suspected. In the second, X-ray examination showed a definite opacity of the right antrum. The appearance of the ganglion at operation is characteristic, for in place of the loose woven meshwork of fibres it is hard and glistening and free from the troublesome oozing so commonly met with. It appears to be thicker and whiter than normal. The sensory root was divided, with relief of the lancinating pains, but a deep, indescribable, but not severe discomfort persisted.

REFERENCES.—¹*Arch. of Neurol. and Psychiat.* 1922, Oct., 412; ²*Acta Med. Scandinav.* 1925, lxiii, 7; ³*Surg. Gynecol. and Obst.* 1927, Feb., 202.

GASTRIC AND DUODENAL ULCER. *Robert Hutchison, M.D., F.R.C.P.*

PATHOGENESIS.—Little real progress has been made in our knowledge of the mode of origin of peptic ulcers since the subject was reviewed in the ANNUAL for 1927. It is generally agreed that chronic ulcers originate from acute erosions, so the question of pathogenesis resolves itself into two: (1) the cause of the erosions, and (2) the reason why they do not heal but go on to form chronic ulcers. Perhaps the most popular theory of the origin of the erosions is that they are the result of hæmatogenous infection, though Rosenow's theory, referred to two years ago, that the infection is always a specific one and originates from a local focus, is not now generally regarded as proved. C. L. Connor¹ is of opinion that those ulcers which become chronic begin in the submucosa and spread beneath it with sloughing of the mucosa; that they become chronic because of a continuance of the original infection, and heal slowly because of the great loss of tissue.

H. Hohlweg,² from his studies with the gastroscope, is convinced that the erosions are originally caused by a gastritis, which he considers to be a fairly common condition. For him every chronic ulcer dates back to a gastritis. This view has been strengthened by the histological study of portions of the stomach resected for ulcer, as G. Halperin³ points out.

It is another generally accepted opinion that the conversion of an erosion into a chronic ulcer is brought about by the action of the acid gastric juice, and C. B. Morton⁴ describes some new experiments on dogs which tend to confirm this. It is a matter of common knowledge, however, that the acidity of the gastric contents in many cases of chronic gastric ulcer is not above normal. To meet this difficulty Halperin calls attention again to Aschoff's conception of the gastric 'pathway' or 'channel' (Magenstrasse)—a groove in the mucous membrane running along the lesser curvature from the cardia to the pylorus. The special characters of this channel are due to the existence there of oblique muscle fibres as well as of the circular and longitudinal ones. By the contraction of its fibres the 'Magenstrasse' can form a lumen of its own distinct from that of the rest of the stomach. The blood-supply of this area seems to be relatively poor, and it is subject to powerful muscular contractions. The peculiar arrangement of its folds also makes it difficult for an erosion here to heal, and the mucous membrane of this area does not secrete a protective mucus. All these facts may help to explain the much greater incidence of chronic ulcer in this part of the stomach. Halperin is of opinion that the work of Aschoff and the development of the 'inflammatory theory' of origin of erosions (in a gastritis, in short) have thrown new light on the etiology of ulcer.

TREATMENT.—A reaction is observable at present, even in America, against the over-elaboration of the details of the medical treatment of gastric and

duodenal ulcer and a return to simpler methods. As L. Forman⁵ points out, the treatment of gastric ulcer has changed in the last thirty years, but the statistical results of treatment at intervals of roughly ten years throughout that time remain very much the same. Forman found that of 41 cases of chronic gastric ulcer treated medically at Guy's Hospital and examined after an interval of at least five years, 22 per cent were free from symptoms and 20 per cent were greatly improved; 57 per cent were as bad as before or worse. He compares these with the late results in 39 cases treated surgically at Guy's, published by Conybeare, which showed 58 per cent free from symptoms or greatly improved, and 40 per cent *in statu quo* or worse. Forman did not find that cases with a long history were more unfavourable for medical treatment than those of shorter duration. Franklin W. White⁶ claims better results for medical treatment, but it is to be noted that his material was drawn from private practice. He found 39 per cent of gastric and 59.2 per cent of duodenal ulcer cases free from symptoms after from three to five years. He points out, however, that his cases included many of the earlier and milder type, and that the results must not be compared with those obtained in a series of severe cases sent to a surgical clinic. The disadvantages of medical treatment, as White points out, are that it is more tedious and requires more self-control and intelligence (permanently) on the part of the patient; also, it does not deal with allied disease coexisting in the abdomen. He pleads, therefore, for co-operation between the physician and surgeon. On the other hand, he does not think that the fear of an ulcer becoming malignant justifies operation. He found this happen in only 2 per cent of his cases, and is of opinion that nearly all cancers supposed to develop from chronic ulcer have been malignant from the start. [But how are these to be recognized except by operation?]

F. G. Nicholas and Alan Moncrieff⁷ have checked the healing of gastric ulcers in 17 cases by *X-ray examination* at intervals over a period of two years. They consider this method, in spite of certain fallacies, as being of great value as a gauge of healing. They found the characteristic 'niche' disappear and reappear coincidentally with remission and return of clinical symptoms. The ulcer may disappear very quickly—sometimes in four weeks. There was no relation between the length of history or size of ulcer and the rate or permanence of healing. [This confirms Forman's observations on results of treatment.] Healing and recurrence also took place independently of any treatment, illustrating the 'natural periodicity' of peptic ulcer. Pain often returns before the ulcer can be shown radiologically, and consequently a negative examination between two 'attacks' of ulcer, or even at the beginning of an attack, does not exclude the existence of an ulcer.

REFERENCES.—¹*Boston Med. and Surg. Jour.* 1926, Nov., 971; ²*Munch. Med. Woch.* 1926, Dec., 2103; ³*Internat. Abstr. of Surgery*, 1926, Sept., 173; ⁴*Ann. of Surg.* 1927, Feb., 207; ⁵*Brit. Med. Jour.* 1927, 1, 796; ⁶*Amer. Jour. Med. Sci.* 1927, May, 629; ⁷*Brit. Med. Jour.* 1927, 1, 999.

GASTRIC AND DUODENAL ULCER, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

Hæmatemesis of Dubious Origin.—X. Delore, H. Comte, and R. Labry¹ report two cases of patients explored for profuse hæmatemesis in whom no ulcer could be found, but there was great dilatation and tortuosity of the stomach arteries. After ligation of these the bleeding did not recur.

Causation of Gastric Ulcers.—G. Bohmansson² and other Scandinavian writers maintain that there is always a marked gastritis of the pyloric antrum in patients with ulcer; they take the gastritis to be primary. This is an argument in favour of gastrectomy methods.

Perforated Ulcer.—J. Dunbar² presents a study of 387 cases operated on at Glasgow during the ten years 1913–24. The results were as follows:—

			Per cent recovered
Operated within 6 hours	..	..	77.0
" " 8	..	..	75.5
" " 12	..	..	70.0
" " 24	..	..	66.2
All cases	..	..	54.0
With gastro-enterostomy, within 6 hours	..	..	62.5
" " " " 8	..	..	58.6

It will be observed that when a gastro-enterostomy was combined with the simple suturing, the death-rate went up, though presumably the most favourable cases were chosen for the purpose. Nor do the end-results, as regards benefit afterwards, seem to be any better. Six patients came back for a secondary gastrojejunostomy, after simple suture at the time of perforation.

G. F. Cottle and O. B. Spalding⁴ have found help from the radiogram in diagnosis of perforation of an ulcer. Free gas can usually be seen between the liver and diaphragm (*Plate XIX*).

The causes of death in this condition are analysed by J. B. Stenbuck,⁵ who puts them into three classes: in the first, they die within three days, from shock; in the second, the cause is peritonitis and is fatal within a week; in the third or late group, death is due to subphrenic or liver abscess. Unfavourable factors are a large perforation and a full stomach. G. Söderlund,⁶ of Stockholm, advises a gastrostomy at the time of operation, to permit of earlier feeding and to avert post-operative vomiting. Only one patient out of 32 died, which is extraordinarily good; but the chief credit would seem to rest with the general practitioner who sends the case in promptly, for 27 were operated on within six hours of perforation! Only one was over twelve hours.

Coincident Gastric and Duodenal Ulceration.—Two papers appear, by D. P. D. Wilkie⁷ and by X. Delore⁸ and colleagues, emphasizing the importance and frequency of this association. Wilkie has seen it 27 times in five years, and the French surgeons 68 times. It may give rise to stenosis of the pylorus in conjunction with an hour-glass stomach. These patients are likely to be in poor condition, and Wilkie recommends short-circuiting rather than excision. When there is no great contraction, Balfour's operation is best.

Pre- and Post-operative Treatment.—American opinion is inclined at present to pay considerable attention before and after gastric operations to the CO₂ content of the blood. Reduction of the alkali reserve (acidosis) below 40, generally due to starvation, is a danger signal, and should be counteracted by administration of glucose and bicarbonate of soda. Alkalosis, with a CO₂ figure above 80, is likely to be followed after operation by coma, and is best controlled by intravenous hypertonic (8 per cent) of sodium chloride and by hydrochloric acid by mouth. It may be due to the Sippy treatment. The whole subject is discussed by R. F. Carter.⁹

Lambret¹⁰ advocates the pre-operative use of an enterococcus vaccine to prevent post-operative pulmonary complications. Seven doses are given. An intradermal test is first made; if it is negative, the vaccination is not necessary. He has performed 300 consecutive gastric operations without a death.

Technique.—The dust is beginning to settle down after the conflicts which recent years have witnessed between the advocates of resections and short-circuitings respectively. There has, however, been one big debate on the subject,¹¹ in which gastro-enterostomy was defended by H. J. Paterson, and

resections by H. Finsterer. Paterson has returned to his first love, and again does his anastomoses in front of the transverse colon. The following are his results of gastrojejunostomy in 1913-23:—

Gastric ulcer	172	Died since*	33	410
Duodenal ulcer	323	Fairly well	61	or
Gastric + duodenal	4	Quite well	316	82%
		Bad result	37	
		Untraced	48	
Total	499			
Recovered	495			
Died	4			
Total	499			
			Total	495

* Cured of gastric trouble.

He emphasizes, of course, the importance of after-care. In his opinion, even those cases in which the ulcer invades the pancreas will usually be cured by gastro-enterostomy. Finsterer, of Vienna, has performed 593 resections for gastric or duodenal ulcer, with a death-rate, in his later cases, of about 4 per cent. Of 103 resections for gastric ulcer, all but two were cured, and no dietetic restrictions were imposed after the first few months. Of 236 resections for duodenal ulcer, 223 were cured, 8 were improved, and 5 were no better.

Lindboe¹² has re-examined 90 cases after a gastric resection, and finds 90 per cent cured and 4.4 per cent improved.

J. S. Horsley's¹³ method of performing the Billroth I operation was noticed in the MEDICAL ANNUAL last year. He writes again on the subject and supplies pictures (*Plate XX*). It will be observed that the upper border of the duodenum is brought up to the lesser curvature of the stomach, and the excess of stomach closed below the anastomosis, not above; also, the duodenum is flared open by an anterior incision to enlarge the area available for suturing.

H. S. Souttar¹⁴ figures a modification of Schoemaker's stomach clamp, by which it is possible to do a Polya operation with quite a small sacrifice of stomach in cases of small ulcer on the lesser curvature.

C. A. Pannett¹⁵ returns to his advocacy of resection not only for gastric but also for duodenal ulcers. He admits that it is a tedious and even a difficult procedure, but he says that the mortality is not above 4 per cent, that it is available in 71 per cent of cases, and cures 85 per cent, whereas gastrojejunostomy in his hands only cured 55 per cent. He comments on the difference of opinion on this subject; he is supported by Lewisohn, Forsyth, Widler, von Haberer, and others, but, on the other hand, gastro-enterostomy is said to give a much higher percentage of good results by Moynihan, Sherrin, Walton, and Balfour. He is inclined to think either that they operate on a different type of case, or that they are satisfied with a less exacting standard of cure. [I have followed up carefully all my gastric and duodenal cases, and my experience coincides with those who find that gastro-enterostomy in duodenal patients shows practically perfect results in all but about 10 per cent.—A. R. S.]

Unsatisfactory Results after Gastroduodenal Surgery.—G. de Takats,¹⁶ who has had experience both at Budapest and in Chicago, comments on the worse results shown by anastomosis operations in Europe, on account of poverty and bad feeding. He gives figures to show the slight reduction of gastric acidity after gastrojejunostomy, and the great reduction after a partial gastrectomy. As will be seen, 41 cases at Budapest had to have a secondary resection on account of a failed anastomosis. His figures are as follows:—

PLATE XIX

X-RAY DIAGNOSIS IN PERFORATED GASTRIC ULCER



Skullgram showing presence of gas between the diaphragm and the liver.

By kind permission of 'Annals of Surgery'

PLATE XX
PARTIAL GASTRECTOMY: SHELTON HORSLEY'S MODIFICATION OF THE BILLROTH I OPERATION

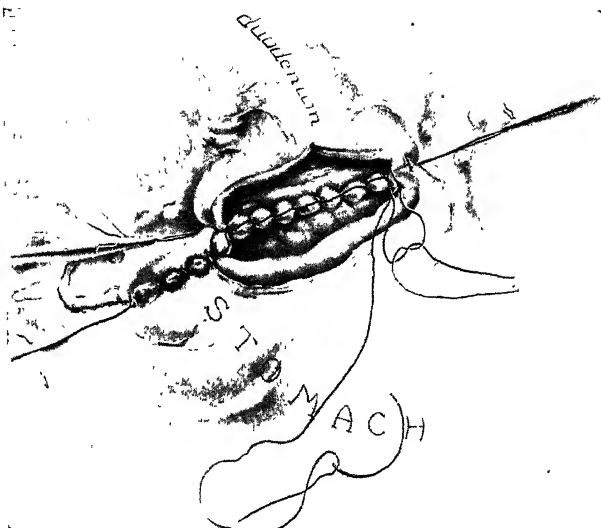


Fig. A.—The posterior row of sutures has been continued, the posterior margin of the stump of the stomach united to the side of the stump of duodenum, and the suture carried over remainder of the stump of stomach, and terminated at the lower border of the stump of duodenum, in a similar manner. The short end from the anterior row of sutures is tied to that from the posterior row, assuring greater security at this point.



Fig. B.—Redundant portion of stump of stomach surrounded by a purse-string suture which invests this portion of the stomach as a test. This suture is continued anteriorly as a right-angle continuous suture, and buries the row of small sutures. Sometimes the stump of the stomach can be sutured to the flared-open duodenum without any redundancy.

By kind permission of 'Surgery, Gynecology and Obstetrics'

LOWERING OF GASTRIC ACIDITY.

Type of operation	Number of cases	AVERAGE ACIDITY	
		Before operation	After operation
Gastrojejunostomy ..	200	F.HCl 24 T.A. 53	F.HCl 23 T.A. 46
Partial gastrectomy ..	200	F.HCl 30 T.A. 56	F.HCl 3 T.A. 15

F.HCl = free hydrochloric acid; T.A. = total acidity.

MORTALITY AND LATE RESULTS AFTER ANASTOMOSIS AND RESECTION
(FIRST SURGICAL CLINIC, UNIVERSITY OF BUDAPEST).

Type of operation	Number of cases	Mortality (per cent)	LATE RESULTS (per cent)		
			Good	Fair	Poor
Gastrojejunostomy ..	274	5.8	50	22	28
Partial gastrectomy ..	226	5.4	84	10	6
Secondary resection :					
For recurrence ..	20	7.3	81	14	5
For jejunal ulcer ..	21				

Classification of results: Good = no complaints; Fair = occasional complaint; Poor = return of symptoms or new symptoms.

First 200 anastomoses ..	..	2.7 per cent mortality
Last 74 anastomoses ..	..	7.7 " "
Last 88 resections ..	..	3.3 " "

E. Lewisohn¹⁷ writes to the same effect. As is well known, in his clinic the proportion of gastrojejunal ulcers after gastro-enterostomy reached the truly formidable figure of 34 per cent. After a resection he finds that in 75 per cent of the cases there is more or less permanent achlorhydria, and no cases of gastrojejunal ulcer. He has not seen this condition lead to pernicious anæmia. [Others have.—A. R. S.] Duval, Roux, Gatellier, and Moutier¹⁸ maintain that many of the troubles that may follow gastric operations are due to septic infection of the stomach wall and adjacent lymphatics. To this they attribute post-operative vomiting and gastrojejunal ulcer.

Gastrojejunal Ulcer.—Experience at the Mayo Clinic of 270 cases of this condition, recorded by D. C. Balfour,¹⁹ is to the effect that it is seen in about 1.6 per cent of the patients on whom a gastro-enterostomy has been done. As soon as it is diagnosed it ought to be operated on. If the duodenal or pyloric ulcer for which the original operation was done has undoubtedly healed, and there is no scar-contraction, it is best merely to undo the gastro-enterostomy. Often this is impracticable, and then the proper treatment is a partial gastrectomy. All other methods are very uncertain in their effect.

Conditions Mimicking Gastroduodenal Ulceration.—E. S. Judd,²⁰ and other observers also, point out that when one operates on a diagnosis of duodenal ulcer, one may find congestion of the first part of the duodenum and stippling of the mucosa, but no ulcer and no thickening, even if the duodenum is opened to look. This is called *duodenitis*. The symptoms and X-ray signs may be just the same as in ulcer, except that a niche is not seen. Probably the condition is on its way to pass into duodenal ulcer. The treatment advised is excision of the inflamed area of duodenum, with part of the pyloric ring, followed by end-to-end anastomosis of stomach to duodenum. In 94 per cent cases this was curative.

Duodenal ileus, attributed to constriction of the duodenum where it is crossed by the superior mesenteric vessels (*Fig. 30*), is associated with vague symptoms like ulcer, but with less severe pain. It may be part of a general visceroptosis or gastropptosis. The diagnosis is usually clear with X rays. If postural

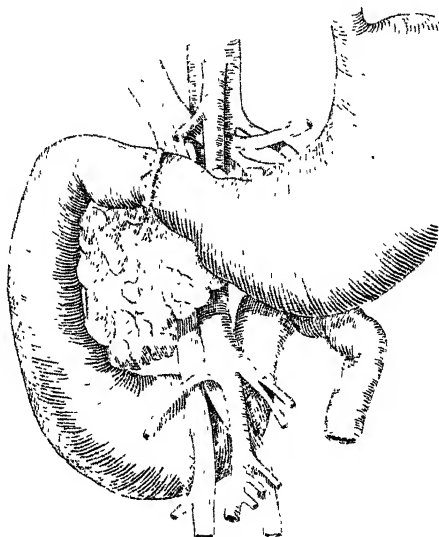


Fig. 30.—To illustrate ileus of the third part of the duodenum from pressure of the superior mesenteric vessels. Stomach, first part of duodenum and portion of second part and fourth part of duodenum, and jejunum entirely unaffected; pancreas not pulled forwards: pyloric vein vertical; first part of duodenum horizontal. (*By kind permission of the 'British Journal of Surgery'.*)

methods fail, the best treatment is duodenojejunostomy (D. P. D. Wilkie,²¹ J. E. Adams²²). Wilkie reports 57 cases followed for the most part for upwards of three years; 23 were cured, 11 improved, 12 better, but still getting digestive troubles, and 9 no better. [This accords with my own experience.—A. R. S.]

REFERENCES.—¹*Presse méd.*, 1926, Jan. 20, 83; ²*Acta Chir. Scandinav.* 1926, lx, Supp. 7; ³*Glasgow Med. Jour.* 1926, Aug., 109; ⁴*Ann. of Surg.*, 1927, March, 450; ⁵*Ibid.* May, 713; ⁶*Practitioner*, 1927, March, 171; ⁷*Brit. Med. Jour.* 1926, ii, 469; ⁸*Presse méd.* 1926, Aug., 996; ⁹*Surg. Gynecol. and Obst.* 1927, Jan., 74; ¹⁰*Bull. et Mém. Soc. nat. de Chir.* 1926, lvi, 278; ¹¹*Brit. Med. Jour.* 1926, ii, 555; ¹²*Zentralbl. f. Chir.* 1926, liii, 1142; ¹³*Surg. Gynecol. and Obst.* 1927, Feb., 215; ¹⁴*Brit. Med. Jour.* 1927, i, 501; ¹⁵*Lancet*, 1927, i, 966; ¹⁶*Amer. Jour. Med. Sci.* 1926, July, 45; ¹⁷*Surg. Gynecol. and Obst.* 1927, March, 344; ¹⁸*Bull. et Mém. Soc. nat. de Chir.*, 1926, lv, 270; ¹⁹*Ann. of Surg.* 1926, Aug., 271; ²⁰*Ibid.* 1927, March, 380; ²¹*Amer. Jour. Med. Sci.* 1927, May, 643; ²²*Brit. Jour. Surg.* 1926, xiv, July, 67.

GASTRIC FUNCTION TESTS.

Robert Hutchison, M.D., F.R.C.P.

It has often been pointed out that the composition of the samples of gastric contents obtained by the fractional method depends to a considerable extent on the position which the tube occupies in the stomach (*see* MEDICAL ANNUAL, 1923, p. 189). R. J. Duthie¹ has reinvestigated this matter in three cases by

means of an ingenious two-way Rehfuß tube. He found great differences in the free acidity and total chlorides in the upper and lower regions of the stomach respectively during the digestive cycle, the excess of free acid in the upper region in one case being as much as 33 units one hour and a half after the meal, with a difference of 65 in total chlorides. The differences are due to the fact that duodenal regurgitation affects the contents chiefly at the pyloric end. Arnold Galambos² has investigated the secretion of the *fasting stomach* by the fractional method, and comes to the following conclusions: (1) The Rehfuß tube may be introduced into the fasting stomach and left there to induce gastric secretion, which can then be fractionally withdrawn. (2) The examination and study of gastric juice unmixed with food can thus be made possible, and the results used to complete the test-meal examinations, or as a substitute for them, as the method gives a more exact account of the concentration and quantity of gastric juice secreted. (3) Two types of gastric secretion are discriminated, that of the normal stomach and that of the stomach affected with irritative secretory disturbance. (4) In the normal stomach after fasting, even when the tube is left in place from ten to sixty or more minutes after introduction, no gastric secretion can be obtained, either by drainage or suction. (5) In the stomach affected by irritative secretory disturbance, there is hypersecretion on fasting, usually with hyperacidity, though normal acidity and occasionally anacidity may be noted. After a three- to fifteen-minute interval similar gastric juice may be obtained by suction. Occasionally, hypersecretion with anacidity is found in cases showing free hydrochloric acid and possibly later hyperacidity after the customary test meals. (6) The amount of gastric juice secreted immediately after the insertion of the tube may be several times greater than the *relative* quantity accumulated during the night's rest. The acid concentration is, as a rule, much less increased. (7) From half an hour to one hour after the tube is inserted, a phase of exhaustion of the mechanism of gastric secretion will intervene, the quantity and concentration of the gastric juice being markedly reduced temporarily. (8) This phase of exhaustion is characterized by a protective mechanism which produces a secretion with heavy admixture of mucus and regurgitated gall, and also containing duodenal secretion. (9) The first phase of exhaustion endures from ten to fifteen minutes. After an active interval of thirty to sixty minutes, there will be a second period of exhaustion, often lasting many hours. (10) Information concerning the motility of the stomach can be obtained through the use of this test, at the same time that the gastric juice is being withdrawn for study. For this purpose it should be performed when the stomach has just been emptied after the administration of a test meal, e.g., two hours after the test breakfast.

T. A. Butcher,³ in observations made upon himself by the fractional method, found that nausea and distaste for an article of diet may cause a great diminution of both secretion and motility, and that the 'appetite juice' is secreted in considerable quantity on the sight, taste, or smell of food, the secretion going on for some time after the stimulus stops. Atropine caused diminution of secretion along with relaxation of the pylorus. No definite conclusions could be drawn as to the secretion of pepsin.

REFERENCES.—¹*Quart. Jour. Med.* 1927, April, 265, ²*Arch. of Internal Med.* 1926, Nov., 654; ³*Quart. Jour. Med.* 1926, July, 455.

GASTRITIS, PHLEGMONOUS.

Robert Hutchison, M.D., F.R.C.P.

John S. Lawrence¹ has reviewed all the cases of this rare disease hitherto described, and adds two of his own, making a total of 239 recorded cases in all. The etiology is still unsettled; infection seems to take place sometimes by direct extension from a damaged mucosa, at others via the blood-stream. The

submucous coat is the chief seat of pathological change, reaching sometimes a thickness of $2\frac{1}{2}$ cm. The mucosa may be quite intact or show degenerative changes. The usual infecting agent is a streptococcus. The symptoms are those of an acute upper abdominal condition, and simulate the symptoms of gall-stones, perforated ulcer, or acute pancreatitis. One rather characteristic sign is that the patient has *considerable pain when lying down, but this, as well as tenderness, disappears on sitting up*. Diagnosis, however, unless at exploration, is not commonly made. No treatment is successful, and death is the usual result.

REFERENCE.—¹*Boston Med. and Surg. Jour.* 1926, Oct. 21, 800.

GAUCHER'S DISEASE.

Reginald Miller, M.D., F.R.C.P.

Fresh light has been thrown on an obscure condition in a recent paper by Graham and Blacklock.¹ The disease first described by Gaucher in 1882 is essentially a primary splenomegaly associated with leucopenia; that it is liable to occur in several members of a family was remarked by Collier thirteen years later. It is characterized by a slow, progressive enlargement of the spleen, which may attain an enormous size (one-sixth of the total body-weight is recorded by Graham and Blacklock in a child under their observation),



Fig. 31.—Gaucher's disease. Film of material obtained by splenic puncture. A few large cells, some of which have more than one nucleus, and showing a reticulated appearance of their protoplasm, are noted. The figure shows the size of the large cells as compared with the small darkly staining red blood-cells. (Hæmatoxylin and eosin). (By kind permission of 'Archives of Disease in Childhood'.)

and by a number of variable, ill-defined symptoms of which pain in the side, probably caused by the actual size of the tumour, is perhaps the most constant. In a number of cases no symptoms referable to the disease are complained of, and the condition is discovered by chance in the course of a routine examination. In addition to the splenomegaly, enlargement of the lymphatic glands in the thorax and abdomen is usually found, as also of the liver. This is a point of value in making a diagnosis from Banti's disease, as in the last-named condition the liver is not enlarged except in the earliest stages. The blood picture is very constant in showing a leucopenia, usually without other striking variation from the normal, though occasionally

a definite reduction in the number of red cells has been noted. The title 'splenomegaly with anæmia' frequently used in reference to Gaucher's disease is therefore an inaccuracy and should be discontinued, since the absence of anæmia forms another point of differentiation from Banti's disease. There is a tendency to hæmorrhage from the mucous surfaces, especially the gums, but the bleeding is usually confined to oozing, large hæmorrhages being of very infrequent occurrence. The fragility of the red cells is unaltered, and a case of Graham and Blacklock's showed a slight increase in the coagulation time (128 seconds).

The post-mortem appearances show characteristic changes limited to the tissues of the reticulo-endothelial system, and lend colour to the German view that it is in the reticulum only that the Gaucher cells take their origin. These Gaucher cells are found in the pulp-spaces of the spleen, in clumps in the branches of the splenic vein, and in the adventitia of the smaller vessels; in clusters round the portal tracts in the liver; in the hæmolymp glands, and in the bone-marrow. They are characterized by their large size, small darkly-staining nucleus which is sometimes multiple, and clear, finely reticulated protoplasm (*Fig. 31*). It is to be remarked that they are always seen in close relation to the reticulum.

Gaucher's disease was formerly supposed to be an endothelioma of the spleen, and this appears to have been the view held by Osler. Later investigators, however, have brought forward evidence favouring the opinion of Schlagenhauer,² who regarded it as a disease of the lymphatic-hæmatopoietic system; in particular, the arrangement and widespread distribution of the typical Gaucher cells throughout the reticulo-endothelial system lends colour to this conception of the disease. The German view that the Gaucher cells originate in the reticulum only is that which the evidence available seems most satisfactorily to support. The close relationship of these cells in all cases to the reticulum has already been mentioned, and Graham and Blacklock have drawn attention to the fact that they fail to show any but the faintest iron reaction with appropriate staining methods, whereas endothelial cells show it well.

These writers also demonstrate satisfactorily the presence of lipid bodies in the Gaucher cells—a condition which has hitherto been disputed—and bring forward the theory that a derangement of lipid metabolism in these cases provokes a reaction on the part of the reticulo-endothelial cells. In support of this view they draw attention to the enlargement of the spleen occurring in diabetes with lipæmia, the large, lipid-containing cells found in this condition closely resembling the Gaucher cells, for which they have sometimes been mistaken. They also instance the widespread occurrence of large cells containing lipid substances throughout the reticulo-endothelial system in Niemann's disease and in animals who have been fed with excess of cholesterol—both conditions involving essentially a strain on the storage capacity of the organism for fatty elements.

The diagnosis of Gaucher's disease does not as a rule present any great difficulty, if the leucopenia and the enlargement of the liver are borne in mind. These two phenomena may be present in the earliest stages of Banti's disease; but the subsequent course of the case will distinguish between the two conditions, while the diagnosis can be clinched by the examination of material obtained by splenic puncture, all doubt being removed by the finding of the typical Gaucher cells in films made by means of this procedure. Splenectomy has been performed in a certain number of cases, and while there is no convincing evidence that the course of the disease is thereby influenced, a certain amount of relief from symptoms caused by the size and weight of the spleen itself may be obtained.

REFERENCES.—¹*Arch. Dis. in Childhood*, 1927, ii, 267; ²*Virchow's Arch. f. path. Anat.* 1907, cxxxvii, 125.

GENERAL PARALYSIS. (*See* DEMENTIA PARALYTICA.)

GENITAL PROLAPSE. (*See* PROLAPSE, GENITAL.)

GERMAN MEASLES. (*See* RUBELLA.)

GLANDULAR FEVER.*J. D. Rolleston, M.D.*

Among the numerous papers which have recently appeared on the subject of glandular fever or infectious mononucleosis, mention may be made of those by C. W. Baldridge, F. J. Rohner, and G. H. Hausmann,¹ H. A. Salvesen and R. Magnusson,² J. E. Cottrell,³ and H. Fox.⁴ Baldridge, Rohner, and Hausmann, who record their observations on 50 cases in patients from 6½ to 40 years old, define glandular fever as an acute infectious disease of unknown etiology, usually of short duration, characterized by fever, enlarged lymphatic glands, and the occurrence of numerous mononuclear cells in the circulating blood. The following varieties are described: (1) A septic type which must be differentiated from pyogenic septicæmia, typhoid fever, miliary tuberculosis, acute Hodgkin's disease, acute leukaemia, influenza, dengue, epidemic thyroiditis, and tularæmia; (2) Cases associated with fever and membranous angina may resemble diphtheria, scarlet fever, Vincent's angina, or follicular tonsillitis; (3) Cases in which there are only fever, tender glands, and a granular throat, with moderate constitutional symptoms, which may be confused with paranasal sinus disease or mumps; (4) Cases in which abdominal pain and tenderness are outstanding symptoms, simulating appendicitis; (5) Cases with an insidious onset and few symptoms. Cases in which the adenopathy is the outstanding feature must be distinguished from malignant lymphomas (including chronic lymphocytic adenitis, and lymphosarcoma), tuberculous adenitis, syphilis, and Still's disease.

REFERENCES.—¹*Arch. of Internal Med.* 1926, xxxviii, 413; ²*Norsk Mag. f. Laege.* 1927, 189; ³*Amer. Jour. Med. Sci.* 1927, clxxxiii, 472; ⁴*Ibid.* 486.

GOITRE. (*See also* THYROID GLAND, SURGERY OF.)

GOITRE, EXOPHTHALMIC: TOXIC ADENOMA. *Ivor J. Davies, M.D.*

Diseases of the thyroid gland have been fully described in previous issues of the ANNUAL (*see* 1926, p. 468, and 1927, p. 202). H. S. Plummer¹ recognizes two types of hyperthyroidism in adults: exophthalmic goitre and adenomatous goitre with hyperthyroidism. The latter is rarely found under the age of 25 years, and has never been recorded as occurring in childhood. Plummer conceives of the clinicophysiological complex of exophthalmic goitre "as that following the administration of thyroxin, or that associated with hyperfunctioning adenomatous thyroid plus certain notable characteristic findings that can be grouped as ocular symptoms, the characteristic nervous phenomena, and the tendency to crises which may terminate in death". G. S. Williamson and J. H. Pearse² have suggested a useful clinical division of thyroid diseases into primary and secondary Graves' disease. These forms cannot be absolutely distinguished, but the presence of exophthalmos with a goitre of recent development in the former, and of an old adenoma with auricular fibrillation of recent origin in the latter, generally serve to differentiate these two main types of toxic dysthyroidism.

H. F. Helmholz,³ from the Mayo Clinic, presents an analysis of 30 cases of *exophthalmic goitre in childhood*. The condition is extremely rare in early childhood, but becomes more common with the approach of puberty. The largest series of recorded cases of exophthalmic goitre in children is that reported by Sattler⁴ (quoted by Helmholz), who analysed 184 cases, 5.3 per cent of his total of 3477 cases. Lewis⁵ reported five cases of exophthalmic goitre in girls under ten years of age in a total of 152 patients operated on at the Mayo Clinic between 1905 and 1913. Clifford White⁶ reported Graves' disease in a new-born infant whose mother had the disease. Helmholz³ concludes his paper with the following summary: "Thirty cases of exophthalmic

PLATE XXI

EXOPHTHALMOS IN GRAVES' DISEASE



Fig. 1.—Photograph showing the eyes when viewed from the front.



Fig. B.—Lateral view showing globe with eyelids open. Note the position of the cornea relative to the bridge of the nose. (See *Fig. C.*)



Fig. C.—Lateral view with eyelids closed. Note position of upper eyelids relative to bridge of nose. The amount of recession of the globe is apparent.

By kind permission of 'Annals of Surgery'

goitre were observed in children less than 15 years old during the period from January, 1921, to March, 1926. Compound Solution of Iodine, administered in doses of from 5 to 10 min. (0.3 to 0.6 c.c.) three times a day, reduced the basal metabolic rates and toxic symptoms very markedly. It made preliminary operation unnecessary in 11 cases. Of 24 patients operated on, 2 died, one in crisis twenty-four hours after operation, and the other from bronchopneumonia one week after operation".

Allen Graham⁷ regards exophthalmic goitre and toxic adenoma as clinical variations of a single morbid state. He has been unable to recognize any anatomical or histological alteration in the thyroid, or any symptom or sign, that is necessarily pathognomonic of the one or other condition. There are equally good reasons for speaking of dysthyroidism and of hyperthyroidism in cases both of toxic adenoma and exophthalmic goitre. The reaction to iodine is fundamentally the same in the two diseases.

J. H. Tilly⁸ submits a new view of the *mechanism of exophthalmos* in Graves' disease. The protrusion of the eyes has been variously ascribed to an excessive deposit of retrobulbar fat by Jeandrassick and Mendel; to a serous infiltration by Müller; to venous congestion by Graefe, Sattler, and McKenzie; to atony of the muscles which normally maintain the globe within the orbit by Traube, Recklinghausen, Bristowe, and Dalrymple. Landstrom demonstrated the presence of unstriped muscle arising in the orbital septum and inserted as a band over the middle of the globe, and attributed the forward displacement in exophthalmic goitre to increased tonicity of this muscle. Müller described unstriped muscle in the upper lid between the levator palpebrae superioris and the tarsal cartilage, and in the lower lid between the conjunctival fornix and the tarsal cartilage. It is possible that contraction of these muscle bands, which are supplied by the sympathetic nerves, may produce widening of the palpebral fissure. It has been shown that changes occur in the cervical sympathetic ganglia in exophthalmic goitre. Tilly believes that diminution of the effective restraining action of the eyelids is an important factor in the mechanism of the production of exophthalmos.

In order to study this phenomenon more accurately, a kinematographic film was prepared of a profile view of one of the patient's eyes during the acts of opening and closing the lids. The study of this film revealed the striking amount of antero-posterior movement of the eyeball accompanying opening and closing of the lids. It also made it clear that the most of the movement of the globe occurred during the excursions of the eyelids between the points which marked the normal width of the palpebral fissure and its extreme width. The displacement of the globe anteriorly which accompanied the opening of the eyelids was particularly striking and suggestive of the important function of the lids in the retention of the eyeball in the orbit. [If this view be correct, then the eyeball should move forwards when the eyelids are separated to their fullest extent, but such is not the case. The lids must exert some effect upon an anterior displacement of the globes through pressure from behind, but their influence in this direction can only be of a comparatively slight nature. The most likely cause of exophthalmos in Graves' disease is local vascular relaxation, and in part perhaps a result of a slight increase of general intracranial pressure. The condition varies according to the degree of cardiovascular disturbance, for it certainly diminishes in a remission of the disease when the heart's action improves and becomes less rapid.—I. J. D.] (*Plate XXI.*)

A. Graham and E. C. Cutler⁹ found a similar response to Iodine in both exophthalmic goitre and toxic adenoma. In a previous study¹⁰ they concluded that any clinical and pathological differences recognized did not appear to be of such fundamental significance as to establish these two clinical states as

distinct diseases. They state that although it is well established that iodine is distinctly beneficial as a pre-operative preparation for thyroidectomy in cases of exophthalmic goitre, its use in any manner whatever in cases of 'toxic adenoma' has been specifically condemned.¹¹ In a careful study of cases under standard requirements they conclude that no fundamental distinction can be drawn between these two forms of toxic goitre dependent on a response to iodine. Both groups in their experience responded to iodine in the same manner and in about the same ratio. They recommend the administration of iodine as a measure preliminary to operation in all cases of toxic goitre, whether the thyroid be adenomatous or non-adenomatous.

Lambert Rogers, of the Surgical Unit of the Welsh National School of Medicine, in a personal note, states that in the slightly modified form in which he has been using **Goetsch's Adrenalin Test**, i.e., the effect of the subcutaneous injection of adrenalin on the pulse-rate, blood-pressure, and clinical picture (e.g., the aggravation of existing, or production of fresh, signs or symptoms of thyroidism), he found it of much value, and applied it in the majority of goitre cases operated upon because: (1) It enables one to detect the presence of incipient thyroidism; (2) It enables one (a) to estimate roughly the degree of thyroid intoxication, and (b) the extent of the reaction which is likely to occur following operation on the thyroid. He also found that in thyroid deficiency not only is the test not positive, but a negative reaction sometimes occurs, and his experience shows that *if the reaction is absent or negative, the goitre is certainly not toxic and there will be no post-operative reaction*. He controlled the results by carrying out the test—the full details of which he is at present embodying in a paper—on healthy students who very kindly volunteered for this purpose.

REFERENCES.—¹*The Function of the Thyroid Gland*, Beaumont Lecture, St. Louis, C. V. Mosby Co., 1926, 45; ²*Jour. Pathol. and Bacteriol.* 1925, xxviii, 361; ³*Jour. Amer. Med. Assoc.* 1926, July, 157; ⁴*Graefe-Saemisch Handbuch ges. Augenheilk.* 1909, ix, 615; ⁵*Juvenile Hyperthyroidism*, St. Paul, N.J., 1914, 91; ⁶*Jour. Obst. & Gynaecol. Brit. Emp.* 1912, xxi, 231; ⁷*Jour. Amer. Med. Assoc.* 1926, Aug., 628; ⁸*Ann. of Surg.* 1926, Nov., 617; ⁹*Ibid.*, Oct., 497; ¹⁰*Radiology*, 1926, May; ¹¹*Endocrinology*, 1924, viii, 727.

GOITRE, SIMPLE.

Ivor J. Davies, M.D.

J. E. Else¹ submits a simple classification of goitre, inclusive of all the primary pathological processes and of all the clinical types. The term goitre is limited to those pathological processes that directly result from a deficiency of iodine. Else adopts the following pathological classification:—

1. Colloid
2. Hyperplastic
 - a. Cellular
 - b. Acinar
 - i. Adenoma
 - ii. Adenomatosis (or diffuse adenomatous goitre)
 - iii. Compensatory hyperplasia

The clinical classification is based on the presence or absence of symptoms and signs of hyperthyroidism. The toxic type of the hyperplastic cellular variety is the so-called exophthalmic goitre.

H. D. Kitchen,² in a series of cases of *goitre in children*, controlled as well as possible, found: (1) **Desiccated Thyroid**, in safe doses, produced a greater number of marked improvements and less failures than did iodine or the expectant therapy. (2) There were no cases of iodine hyperthyroidism as a result of the use of iodine. (3) Desiccated thyroid, used in small doses (gr. 1 to 2 daily), produced no untoward effects, though given continuously for several months in some cases. (4) It may safely be used in the treatment of goitre in children, even with no facilities for frequent metabolic rate determinations

Frequent observation of the patient must be insisted upon, however, and careful note made of the general health, the pulse-rate, and the weight. The occurrence of any or all of the following—frequent headache, increasing pulse-rate or nervousness, or a loss of weight—is an indication to stop or reduce the thyroid therapy. (5) Treatment is important, for although failing to effect a reduction in the size of the goitre, one may perhaps prevent further enlargement. The sooner treatment is started, and the longer kept up, the better the result is to be anticipated. (6) The prevalence of thyroid enlargement in children is serious. When it is considered that one out of every twenty goitrous mothers gives birth to mentally defective or imbecile children (McCarrison), and that the goitrous girls of to-day are the goitrous mothers of to-morrow, the significance of the problem needs no further emphasis. Basal metabolic rate determinations (Sanborn-Benedict apparatus) were made before treatment was started; most were within normal limits. There were no cases of clinical hyperthyroidism.

E. H. M. Milligan³ writes on goitre in childhood. In a routine examination of 1870 children, it was found that under nine years of age only 0.9 per cent of children had goitre, whereas 8.4 per cent of boys of thirteen and over, and 25.0 per cent of girls of thirteen and over had goitre, showing clearly the greater prevalence of goitre during adolescence, and the greater prevalence in girls. The inquiry also showed that diseases of the nose, throat, and ear have a much greater incidence in goitrous children. Rheumatism was also more prevalent in the goitrous children. The chief types of goitre seen were the simple parenchymatous and puberty hyperplasia. No case of Graves' disease as such is reported, and evidence of hyperthyroidism was not present to any extent among the children, the trend being towards hypothyroid conditions.

R. McCarrison⁴ reports the result of an experiment in *goitre prevention*, being the further history of goitre at the Lawrence Royal Military School, Sanawar, Punjab, India. In a report submitted to the Indian Research Fund Association in 1914 it was shown that the disease there was not due to any chemical substance (lime, magnesium, etc.) in suspension or in solution in the water-supply. The conclusions were drawn that goitre in Sanawar was due to the presence of living micro-organisms in the water supplied to the children for drinking purposes; and that the disease could be eradicated by the provision of a chemically and bacteriologically pure cold water. Goitre had been endemic in Sanawar since the foundation of the school in 1848, and in some years as many as 50 per cent of the children were affected. A new pipe-water supply from the neighbouring station of Kasauli was provided in 1918. Thereafter goitre began to diminish and has now disappeared. No changes of any importance were made in the diet between 1914 and 1922. There was therefore no increase in the iodine intake of the food. It was also shown that the soils and water of both Sanawar and Kasauli are poor in iodine, and thus, that the disappearance of goitre from the school could not be attributed to the presence of iodine in the new water-supply. The conclusion of McCarrison's first report, that endemic goitre in the Sanawar school was due to the bacteriological impurity of the old water-supply, was thus substantiated; and the prediction that it could be eradicated by the provision of a chemically and bacteriologically pure water-supply has been justified by the disappearance of the disease.

L. W. Smith and H. M. Clute⁵ publish reports and pathological notes of five cases of *chronic ligneous thyroiditis* (Riedel's struma). This was first described by Riedel⁶ in 1896, and apparently only 35 cases have since been reported. The disease appears to be three times commoner in women, and occurs mostly in the fourth decade onwards. The symptoms are those of actual pressure or constriction of the trachea, œsophagus, and recurrent laryngeal nerves. A

well-marked goitre of slow development is usually present. Extreme hardness ('stony hardness', 'cast-iron struma', 'woody thyroiditis', etc.) and adhesion to surrounding structures are the prominent features. In these respects it resembles carcinoma, but very rarely extends to the skin as in the latter condition. True toxic symptoms are absent. The early lesion consists of a marked lymphocytic infiltration of the struma, and later a replacement fibrosis, until an almost solid mass of connective tissue is seen. The evidence points towards an inflammatory lesion of unknown etiology. Surgery apparently offers the only permanent relief. Cases of myxœdema following thyroidectomy in Riedel's struma have been reported. A complete bibliography is appended to their paper.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1926, Oct., 1465; ²*Canad. Med. Assoc. Jour.* 1926, Aug., 923; ³*Brit. Med. Jour.* 1926, ii, 373; ⁴*Ibid.* 1927, i, 94; ⁵*Amer. Jour. Med. Sci.* 1926, Sept., 403; ⁶*Verhandl. d. deut. Ges. f. Chir.* 1896, i, 101.

GONORRHOEA.

Col. L. W. Harrison, D.S.O.

METASTATIC COMPLICATIONS.—Breiger¹ relates nine cases which illustrate the importance of looking for a urethral focus in cases of *recurrent iritis*. In two of his cases the original attack of gonorrhœa was sixteen and seventeen years previously. He recommends, besides local treatment, parenteral injections of milk. This paper recalls one by E. R. Chambers,² who, in emphasizing the importance of foci in the prostate and vesicles in iritis, gives six cases in his own experience in which the last attack of gonorrhœa had occurred 4, 5, 9, 10, 13, and 16 years previously, and in all of which, at the time they came under his treatment, gonococci were found in the urethral secretions. Of the importance of the prostatic or vesicular focus in recurrent iritis and rheumatism, nobody with any experience of urogenital disease can have any doubt, but as to the length of time the gonococcus can persist there is still room for differences of opinion, as not all diplococci which are 'morphologically indistinguishable from the gonococcus' are gonococci. In the experience of the reviewer the organisms found in these old-standing cases have been streptococci, staphylococci, and diphtheroids. Some streptococci found in the prostatic secretion can look uncommonly like gonococci but do not stand the test of culture.

A case of *neuritis of the sciatic nerves* resulting temporarily in complete loss of power of the lower limbs is described by Spurr.³ The complication occurred two months after contraction of gonorrhœa. There was no pain unless the back of the thigh was pressed upon, when it was severe. The diagnosis seems to have rested largely on the response to measures directed against the gonococcus. A case of *dislocation of the hip-joint* resulting from gonococcal arthritis is reported by E. H. Schwab.⁴ The patient recovered, with bony ankylosis, after a severe illness.

PROPHYLAXIS.—The common conception of the course of events after entry of gonococci into the urethra is that of Finger, who held that gonococci have hardly begun to penetrate the epithelium at the end of 36 hours. On this it is believed that thorough washing of the urethra within a few hours of exposure to infection is practically certain to prevent gonorrhœa. K. M. Walker⁵ produces evidence which may explain the failure of prophylactic measures well carried out very shortly after exposure. In 1909, confirming the work of P. Blandini, he found that when *B. prodigiosus* is placed on the surface of the urethra a widespread diffusion of the organisms has taken place through the lymphatics in twelve hours. Later he was able to demonstrate the same in the case of a man within whose meatus he had planted two loopfuls of *B. prodigiosus*. Seven hours later he performed a partial amputation and found that, although the organisms had not spread an inch along the surface, they

were widespread in the submucous tissues. The experiment was repeated, and the results were confirmed, in a monkey. The author thinks that when the ordinary prophylactic measures succeed it is because the tissues have been able to deal with gonococci which have penetrated already to the submucous tissues.

TREATMENT.—In cases of syphilis suffering also from chronic gonorrhœa which he had treated for the syphilis with **Malarial Inoculation**, Lenzmann⁶ found that gonococci had disappeared. Accordingly he gave malaria to 5 males and 68 women suffering from chronic gonorrhœa only, and obtained cures in all the males and 53 of the females.

What may prove to be the most notable advance in the treatment of gonococcal infections which has been made for many years has been published by E. C. Lambkin⁷ and Lambkin, Dimond, and Robertson.⁸ Broadly, the treatment consists in (1) The intra-urethral injection of a **Toxin-free Product, or Fraction, of the Gonococcus**; (2) Intradermal and subcutaneous injection of the same; (3) Maintenance of the hydrogen-ion concentration of the patient's tissues at a point represented by a pH of the urine of 7·2 to 7·4; (4) Test of cure by the provocative injection of gonococcal endotoxin. Latterly this endotoxin has been used in smaller doses to stimulate the urethral tissues and so evoke a better response to the application of the antigenic fraction mentioned under (1). It was found by Dimond that, if the gonococcus is cultivated on a special medium, approximately one-third of all strains isolated form polar bodies which take the same stains as do the polar bodies in diphtheria bacilli. By special cultivation of these strains a product was obtained which was rich in polar bodies, and these could be separated from the rest by fractional centrifugalization. Experiments showed them to be atoxic and antigenic.

Supporting this, J. O. Oliver, working in the laboratory of the V.D. Department, at St. Thomas's Hospital, found that intradermal and hypodermic injections of this polar-body vaccine quickly raised the gonococcal complement-fixation reaction of non-gonococcal subjects. The treatment is carried out as follows: The urethra is irrigated with 1–16,000 potassium permanganate, chiefly with the idea of cleansing it thoroughly. The polar-body product of at least 20,000 gonococci, and preferably of 80,000 or 100,000, in 20 c.c. mucin, is then injected into the urethra and retained by the patient for as long as possible—say three hours. At the same time an intradermal injection of the polar-body vaccine is administered in a dose corresponding to 200 million (0·2 c.c. of a strength of 1000 million per c.c.). A daily estimate of the pH reaction of the urine is made, and when this is on the acid side of 7·2, **Disodium Monohydrogen Phosphate** is administered in large doses. The rationale of this is that when the tissues are too acid, the gonococcus becomes protected by scleroprotein, and when they are too alkaline, irritant toxins are evolved from the gonococcus. In favourable cases the discharge dries up after the first three days, and all provocative measures, including injection of the endotoxin mentioned above, fail to provoke a return. In other cases the discharge dries up only temporarily, and, unless the injections are repeated, a relapse occurs. The authors produce evidence to the effect that, even with the treatment in its present immature stage, they have materially reduced the average duration of stay of their military patients under treatment.

F. Trinca and G. Foreman⁹ have treated a series of over a dozen patients suffering from chronic gonorrhœa by injecting into the urethra two drachms of **Mixed Gonococcal Vaccine** and sealing this in the canal for some hours. In the case reported in detail an increase of urethral discharge followed the injection (as the authors hoped) and then followed an improvement. When progress again became stationary the treatment was repeated. The authors' conception

of the principle underlying this treatment is that the gleet in a case of chronic gonorrhœa manifests an eliminating, defensive reaction on the part of the tissues, and that, if it could be speeded up, eradication of the infecting organisms would be proportionately rapid. Darget¹⁰ also reports good results from the local application of gonococcal vaccines. He gives about 15 urethral injections of a vaccine of a strength of 30 to 50 million per c.c.

Intravenous medication employing **Gonaerine** (which is chemically the same as acriflavine) is reported on by J. Perrin,¹¹ who followed strictly the technique of H. Jausion,¹² injecting intravenously 5 c.c. of a 2 per cent solution three times a week, and applying no other treatment, internal or external. Sometimes the injection causes thickening of the vein wall or even closure, but the author has not noted any general shock such as was reported by Jausion. He finds that the duration of the disease is not reduced by this form of treatment, and, unlike the experience with urethro-vesical irrigation with potassium permanganate, the discharge is not quickly reduced in amount; on the contrary, it seems at first to be increased, owing, as the author thinks, to a stimulation of the defensive mechanism of the tissues. None of his patients suffered from local complications, and he considers that the intravenous injection of acridine dyes has the advantage over other methods that convalescence is not broken by relapses. He would employ this form of treatment in cases where intravesical irrigation is impracticable. R. Duhot¹³ has given 664 injections of 5 c.c. of a 2 per cent solution of **Acriflavine** to 56 patients, of whom 54 are stated to have been cured. Unlike Jausion, he reinforces the treatment with irrigations, employing weak **Potassium Permanganate**. Good results from intravenous injections of **Flavine** are also recorded by Brandan and by Grimaldi and de Surra Canard.¹⁴ Jausion and Pecker¹⁵ have recently modified Jausion's original practice by adding 1 mgrm. **Pilocarpine Nitrate** to each injection of flavine and giving this daily.

Intravenous injections of **Mercurochrome-220** on the plan recommended by Potter and Redewill are reported on favourably by L. H. Williams and G. F. Cooper.¹⁶ The method of Potter and Redewill¹⁷ is to give an intravenous injection of 10 c.c. of a 1 per cent solution of mercurochrome-220 in 50 per cent glucose, followed immediately by an intramuscular injection of milk, the double injections being given every forty-eight hours. In a later paper on this form of treatment Redewill, Potter, and Garrison¹⁸ say that glucose given with mercurochrome activates the dye and reduces to a minimum the risk of anaphylaxis. They claim that, in conjunction with routine treatment, it stops the discharge twice as quickly as does routine treatment alone. In a word, the ideal is routine treatment plus intravenous injections, every forty-eight hours, of mercurochrome in glucose. Williams and Cooper modified Potter and Redewill's prescription for the intramuscular injection by employing a mixture of condensed milk 250, water 250, glucose 50, lactose 50, which was sterilized by autoclaving. Of this mixture they gave 5 c.c., having thirty minutes previously injected 0.2 c.c. of it intradermally to test the patient's sensitiveness to protein. The injections were followed in from one to three hours by an increase of discharge, which then quickly diminished. There was some febrile disturbance on the day of the injection, but this had usually disappeared by the following day. There was no nausea, vomiting, or diarrhœa such as may follow an injection of mercurochrome in watery solution.

At first thought the good results recorded from intravenous injections of such antiseptics as the flavine compounds and mercurochrome might be attributed to a bactericidal action of the chemical; but reflection on the enormous dilution which the antiseptic undergoes in the body fluids must raise some doubt as to the correctness of this hypothesis. Such a doubt is expressed by

the *Lancet*¹⁹ in commenting on some experiments by L. Colebrook and R. Hare,²⁰ which go to show that the intravenous injection of mercurochrome does not raise the bactericidal power of the blood. It seems possible that flavine compounds and mercurochrome must be classed with such non-specific compounds as milk, antityphoid vaccine, and electrargol. To these may be added **Sodium Iodide**, 2 grm. in 20 c.c. water, which has been found useful by Rodriguez²¹ in epididymitis. Also, **Calcium Chloride**, 25 c.c. of a 2 per cent solution used by Leff and Spencer²² in the same complication.

For *gonococcal arthritis* in males, G. Greenberg²³ recommends that the vesicles be treated on a system which proceeds from the simple to the complex and radical. First is tried the ordinary routine treatment of gonorrhœa. If this fails, the vesicles are injected through the ejaculatory ducts, employing a special cysto-urethroscope which he has devised for the purpose. At first the injected fluid is a solution of thorium, of sodium iodide, or of sodium bromide, after the vesicles have been stripped thoroughly. By radiograms taken after this injection he is able to study the size and configuration of the vesicles, as well as their relative position to each other and the number of their convolutions, all of which are important to drainage. He finds that vesicles which approach more nearly to the vertical than to the horizontal plane of the body are more easily drained. By radiograms taken on successive days he is able to estimate the success of simple methods of obtaining **Drainage**, the locality of points of obstruction, and so forth, and to determine if the case can be relieved by injections of 20 per cent **Argyrol** either through the urethra and the ejaculatory duct, or through a modified vasostomy wound on the lines originated by Belfield.²⁴ In cases which do not clear up under the measures sketched above, he drains or dissects out the offending vesicles through an open perineal wound, at the same time draining the prostate. The original article should be consulted for details of the author's technique.

Gonorrhœa in Women.—M. Rorke,²⁵ in an article on the treatment of chronic gonorrhœa, shows by the great variety of treatments which she employs that there is still no royal road to the attainment of a cure. Besides careful local applications she employs **Vaccines** of gonococci and secondary organisms, and also non-specific injections such as **Milk**, **Colloidal Silver**, and **T.A.B. Vaccine**. She considers **Diathermy** the most effective treatment of urethritis, and in cases where there is chronic endometritis with menorrhagia she employs the **Glycerin Drain** method introduced by Hobbs.²⁶ H. W. Martin²⁷ teaches his patients to douche the vagina, and then, whilst lying on the back, to inject with a Day's syringe 25 c.c. of a 1-1500 to a 1-500 solution of **Acridflavine**, which is retained for at least half an hour by the patient keeping on her back. Acridflavine is preferred because it is said not to become inactive on contact with the secretions. The treatment is carried out twice daily. It has no effect on infected Bartholin's glands or Fallopian tubes.

L. E. Burch²⁸ recommends the following procedure for the eradication of a cervical infection. Under sacral anaesthesia or gas, the cervix is brought as near the vaginal outlet as possible and incised with the **Thermocautery** anteriorly and posteriorly as far as the internal os. A gauze pack containing a gonococcicide is placed on the open surface for twenty-four hours, after which a vaginal douche is employed twice daily. For absorption of pelvic masses he uses intramuscular injections of **Milk**, commencing with 5 c.c. and increasing to 10 c.c. every third day. A. Jacoby²⁹ treats gonorrhœa in women as follows: With the patient in the dorsal position, the anterior lip of the cervix is steadied by tenaculum forceps, and the cervix then infiltrated with 1 per cent **Mercurochrome**, making several punctures with a needle of No. 18 gauge. The cervical canal and fornices are then packed with gauze

soaked in 1 per cent mercurochrome. The infiltration is repeated weekly, and the packing every two days. The urethra is syringed with 1 per cent mercurochrome. Infected Skene's tubules are destroyed and Bartholinitis dealt with surgically. [Injection of a Bartholin abscess, after aspiration, with 2 per cent mercurochrome, answers very well.—L. W. H.]

For *vulvovaginitis in children*, Blanco and Villazon³⁰ recommend a **Vaccine** which contains gonococci isolated either from the patient or from another case of vulvovaginitis in a child—not from an adult, as they find that gonococci from vulvovaginitis in children behave differently from those in the gonorrhœa of adults, reacting more strongly to serum from children with gonorrhœal vulvovaginitis than to serum from adults with gonorrhœa both in agglutination and complement-fixation. Their vaccine contains, besides gonococci, *B. coli*, staphylococci, and streptococci.

[The multitude of methods of treatment which have been sketched above and in previous numbers of this ANNUAL may leave the practitioner confused as to the practical line of action to be taken in an ordinary case of acute gonorrhœa. I would advise the following as a routine which has been my own practice and that followed at the St. Thomas's Hospital V.D. Centre for a number of years. In either sex, first make thin smears of the secretions from the different canals infected on microscope slides, because every urethral and every cervical discharge is not necessarily gonococcal. (We also take cultures.) Open the bowels well, enjoin as much rest as is practicable, and prescribe a sedative diuretic such as one containing Potassium Citrate, Hyoseyamus, Belladonna, and Infusum Uvæ Ursi. It is a good thing also to give gonococcal Vaccine and to get the patient to take daily a Food Rich in Vitamin B, such as yeast, marmite, or bemax; both vaccine and vitamin B are intended to raise the resistance. In males I believe strongly that irrigation with weak Permanganate of Potassium, say 1-8000, is by far the best routine local treatment. If it is impracticable for the patient to attend the consulting-room for the purpose, I either teach him to irrigate himself, using a rubber hot-water bottle type of irrigating vessel with a glass Janet pattern nozzle, or send him to one of the public treatment centres with a request that facilities for irrigating himself may be afforded. This last method is a convenience to enable practitioners to treat cases of gonorrhœa at smaller cost, which is analogous to the free supply of salvarsan. As soon as the patient will allow the solution to enter the bladder at low pressure, say a head of three feet, I allow him to do so, as this keeps the posterior urethra well washed from an early date. Irrigations are better carried out twice daily. They are continued for a week after all discharge and threads in the urine have disappeared. If the urethritis lingers on in the state of a morning gleet, it is advisable to investigate thoroughly and systematically the urethra and adnexa to discover the residual focus. The steps of this systematic examination and of the treatment of complications are too long to be detailed here; but it may be mentioned that in epididymitis and prostatitis, as well as metastatic complications, considerable use is made of Diathermy to the epididymis or the prostate and vesicles, according to the case.

In women, besides the general measures mentioned above, daily treatment by a nurse is one secret of obtaining a cure in reasonable time. A female patient cannot apply the local remedies nearly so efficaciously as can a nurse, and if intermediate treatment cannot be obtained privately, I try to make use of a treatment centre for the purpose, sending the directions with the patient. At St. Thomas's Hospital the routine is to irrigate the urethra with saturated solution of Sodium Bicarbonate followed by a 1-1000 solution of Chloramine-T in 1-1000 sodium chloride. Cleanse the cervical canal by swabbing with

sodium bicarbonate solution and then irrigate it with chloramine-T solution as above, using a special back-flow irrigating tube. Pack the vagina with a yard of gauze folded longitudinally into three and soaked in Glycerin of Borax 10 per cent, or Monsol in Glycerin 5 per cent, or Eucalyptus Oil in Glycerin 5 per cent, ringing the changes week by week on these three. Other antiseptics in glycerin are probably as efficacious, but those mentioned answer quite well, the active constituent being the glycerin which promotes drainage from the deeper parts.—L. W. H.]

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GRAVES' DISEASE. (See GOITRE, EXOPHTHALMIC; THYROID GLAND.)

HÆMORRHOIDS, INTERNAL.

J. P. Lockhart-Mummery, F.R.C.S.

TREATMENT.—Rawson Pennington¹ advocates an 'Open' Operation with local removal of the contents of the pile. The pile area is drawn down and prolapsed through the anal opening by means of four triangular forceps. A

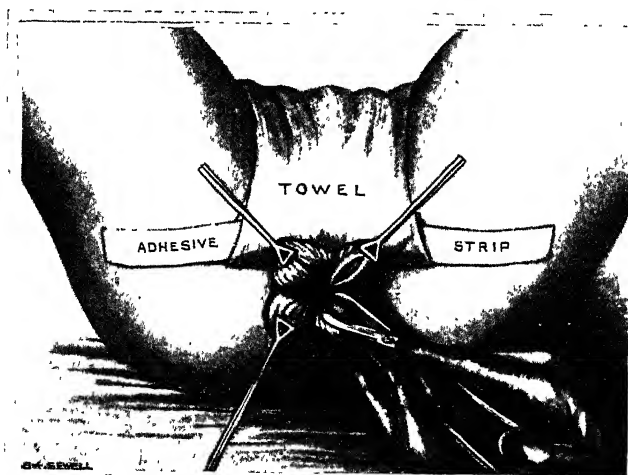


Fig. 82.—Rawson Pennington's 'open' operation for piles. By making a trivial incision in the pile tumour after vis a tergo pressure, the hæmorrhoidal mass will protrude and can be radically removed. (Re-drawn from the 'Journal of the American Medical Association'.)

small slit in a longitudinal direction—that is to say, in the line of the bowel—is made, the contents of each pile are dissected out with scissors, and after stopping any bleeding the small resultant wounds are left open. He claims for this method that the patient need not stay in hospital for more than three to four days.

W. Mitchell² gives the following as contra-indications for the Injection treatment: (1) The piles are confluent and there is no distinct pedicle to each; (2) The whole pile area prolapses outside the external sphincter; (3) The piles are thrombosed and inflamed. He advocates a 10 per cent Phenol Solution for the injections. The injection is made into the base of the pedicle of the piles, and about 8 min. of the solution are injected. Not more than two large or three small piles should be injected at one time. The permanence of cures by injection is uncertain. For cases that cannot be treated by injection, or for which this form of treatment is unsuitable, he recommends ligature and excision.

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HAIR DYES; TOXIC EFFECTS DUE TO.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

L. K. McCafferty¹ gives a comprehensive survey of the different substances used as hair dyes and an account of their toxic effects. He divides them into the following classes: (1) Vegetable compounds; (2) Metallic preparations; (3) Compound dyestuffs with mordants; (4) Synthetic organic dyes; (5) Other preparations: (a) bleaching agents and (b) dye removers.

1. *Vegetable Compounds*.—Of these, henna is the most used and is probably the least harmful. It is ground to a powder, made into a thick paste, and applied to the hair after washing. The resultant colour depends on the time of contact. Indigo and the combination of indigo and henna have been used, but are now abandoned. Of the wood extracts, logwood and redwood are also little used, while walnut-juice is still employed. Pyrogallol is the active principle of nut extracts, and turns brown on oxidation.

2. *Metallic Preparations*.—Lead, silver, copper, tin, etc., have all been used. They act by combining with the sulphur in the hair, producing a metallic sulphide. Many of the commercial dyes to-day consist of a solution of lead acetate containing free sulphur. Silver salts are also used, generally in combination with a 'developer' such as pyrogallol or sodium thiosulphate. All metallic hair dyes are potentially dangerous, as absorption may occur. The author considers they should be prohibited.

3. *The Compound Dyestuffs with Mordants* consist of a vegetable product used with a metallic salt such as an oily paste of nut-galls to which a certain amount of iron and copper oxide is added. In the textile industry to-day the natural power of certain vegetable products is developed by the addition of various metallic mordants.

4. *Synthetic Organic Dyes*.—This group includes the aniline dyes, of which para-phenylene-diamine is the most important and probably the most widely used hair dye at the present time. Its tendency to produce dermatitis in susceptible subjects is well known. Joseph recommends a dye called 'primal', whose base is para-toluylene-diamine, which is said to be detoxified by the addition of sodium sulphite. Certain cases of dermatitis have, nevertheless, resulted from its use. Up to the present no synthetic organic colouring for the hair has been obtained which is entirely non-toxic.

5. *Other Preparations for the Hair*.—(a) *Bleaching agents*, of which hydrogen peroxide is the chief. This is generally used in a 3 per cent (10 vol.) solution.

If used in excess it makes the hair very brittle. (*b*) *Dye removers*. The substances in common use are hydrochloric acid, potassium cyanide, or oxalic acid. All of these are dangerous in various ways to the patient.

The author has found that wet dressing of boric acid solution combined with one-quarter unit doses of X Rays to the face and scalp are of great value in treating para-phenylene-diamine dermatitis. Usually one or two X-ray treatments will suffice to eradicate the intense symptoms of the condition. Later, soothing emollients to the scalp and face will remove the remaining dermatitis.

REFERENCE.—*Arch. of Dermatol. and Syph.* 1926, Aug., 136.

HARE-LIP AND CLEFT PALATE.

John Fraser, Ch.M., F.R.C.S.Ed.

Exception has lately been taken to the existing nomenclature applied to congenital cleft malformation of the face and mouth. The suggestion put forward in 1922 by Ritchie and Staige Davis has certain attractions. Taking the alveolar border as a fixed point, they divide the clefts into three groups: (1) Pre-alveolar; (2) Post-alveolar; and (3) Alveolar. Every cleft of the alveolar border is placed in the third group, whether the lip in front or the palate behind is open or closed; the simple cleft lip is grouped as a pre-alveolar cleft; the cleft of the palate not affecting the alveolar border is post-alveolar. The *alveolar group*, into which the majority of these errors are placed, is subdivided into three varieties: (*a*) the *unilateral*, in which the cleft lies between the pre-maxilla and the maxilla of one or other side; (*b*) the *bilateral*, in which clefts are present on each side between the contiguous margins of the pre-maxilla and maxilla; (*c*) the *median*, in which, owing to faulty development or absence of the pre-maxilla, the cleft lies between the anterior ends of the maxilla. The suggested classification has been adopted by J. E. Thompson¹ in an article on the use of a special flap in closure of unilateral clefts.

In descriptions of the unilateral cleft of the alveolar type, Thompson adopts the plan of dividing the buccal surface of the palate and its associated tissues into two divisions—the 'larger process', that portion of the palate to which the nasal septum is attached; and the 'smaller process', concerned with the maxilla and the palate bone. It is pointed out how large is the part played by the attached septum in figuring the structural arrangements, and it is partly on this peculiarity that Thompson's operation is designed. An anatomical peculiarity of some importance also bears its part in the operative design. It is pointed out that, while the septum and the greater process of the palate are continuous, there is a sharp distinction in the appearance and relationship of the mucous membranes of the two areas—that on the septum being smooth, velvety, elastic, and deep red in colour; that covering the palate being dense, tough, and pale. A more important distinction, however, concerns the matter of attachment. The septal mucous membrane, being loosely attached to the underlying perichondrium, can be easily picked off, leaving the perichondrium still attached to the cartilaginous surface; the mucous membrane, on the other hand, is so closely incorporated with the periosteum covering the palatal plate that flaps lifted up from the hard palate always consist of mucous membrane and periosteum, leaving the underlying bone devoid of covering. The readiness with which the septal mucous membrane may be separated without endangering its own vitality or the vitality of the underlying structure is taken advantage of in the operation.

The author draws attention to a structural feature which is often overlooked in an alveolar cleft palate. Whatever its type, the separation of the maxillary processes concerns the anterior extremities of the alveolar processes. There is relatively little increased separation between the maxillary tuberosities or between the prominences of the alveolar curves; the divergence is from

this latter point forwards, reaching its maximum at the edges of the alveolar cleft. These points are well demonstrated by superimposing the outline of the mandibular curve upon the tracing of the deformed maxillæ (Figs. 33, 34). The object of the operation is to restore the curves of the alveolar border and to close the anterior part of the palate by means of a flap taken from the side of the septum. If the operation is successful, union is secured at the anterior ends of the alveolar processes and of a third or a half of the front of the palate.

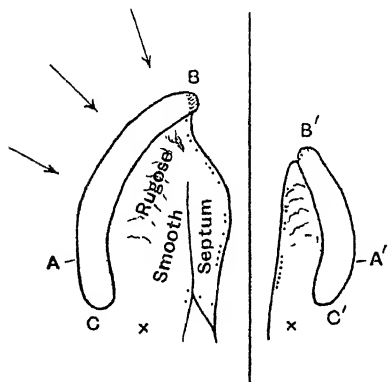


Fig. 33.—J. B. Thompson's cleft-palate operation. Idealized sketch of a plaster mould of a left complete unilateral cleft. The vertical line is in the position of the cleft between the maxillary processes, which have been moved laterally from one another in the figure to bring each side into relief. A and A' are on the most prominent part of the lateral curve of the alveolar border. B and B' are on the anterior ends of the alveolar processes, which have been shaded to show the areas of denudation. C and C' are on the maxillary tuberosities. The crosses, medial and posterior to the tuberosities, are over the hamular processes of the pterygoids. The dotted lines represent the incisions used in raising the palatal flaps. They are only approximately correct. On the palatal surface of the larger process, the rugose and smooth areas of mucous membrane are depicted. The arrows show the direction in which force is applied when moulding the bones together. (Figs. 33-36 re-drawn from the 'Journal of the American Medical Association'.)

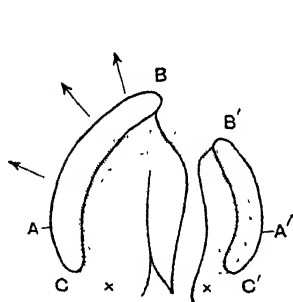


Fig. 34.

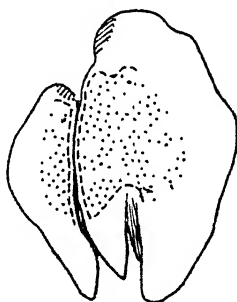


Fig. 35.

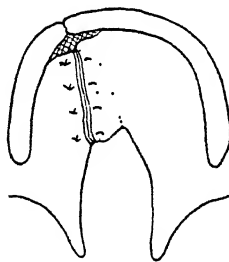


Fig. 36.

Fig. 34.—Cleft palate. Left complete unilateral cleft, showing the separation of the maxillary processes. The horseshoe mandibular curve (shaded) has been superimposed on the maxilla to indicate the degree of the deformity. C and C' show the maxillary tuberosities. A and A' represent the most prominent part of the lateral curve; B and B' are on the anterior ends of the alveolar processes. The crosses behind and medial to the tuberosities show the positions of the hamular processes of the pterygoids. The arrows show the direction of the tongue thrust.

Fig. 35.—Cleft palate. The extent of the flap lifted up from the septum and hard palate is indicated by the dotted area on the right. On the left a similar dotted area shows the extent of flap lifted up on this side. The whole palatal plate on each side is denuded of its mucoperiosteal covering. An oval shaded area is seen on the tip of each alveolar process. These areas are denuded of their mucous membrane and are brought in contact with each other when the maxilla are approximated.

Fig. 36.—Cleft palate. Appearance of the palate when the maxilla are approximated and the flaps fastened together. The tips of the alveolar processes are in contact. Behind them a shaded area is shown which designates the denuded bony surface of the premaxilla and of the lesser palatal process. The line of fusion of the septal flap with the mucoperiosteal flap of the greater process (right) is shown by a dotted line. The vertical mattress stitches are inserted and knotted but not tied tightly. Consequently the flanging of the area of apposition of the flap is not shown. No attempt has been made to obtain perspective, and therefore the septal flap appears much narrower in front than it is in reality.

The description of the operation is divided conveniently into stages: (1) The cutting and separation of the septal and palatal flaps. The incisions by which these flaps are separated are shown in the accompanying diagram (*Fig. 35*). (2) Moulding the maxillæ. This is done by thumb pressure, the force being directed at first against the front of the larger process at a point lateral to the premaxilla, and, in order to avoid damage to the delicate process in which the tooth elements are embedded, the pressure is exerted on the outside of the cheek. No attempt should be made to mould the lesser process, it being merely steadied by the thumb of the opposing hand. (3) Suturing the maxillæ. This is achieved by passing a wire through the maxillæ above the alveolar margins about the level of the second premolar tooth, the wire passing in front of the premaxilla without penetrating it. The wire so passed is not tightened and secured until the palatal flaps have been approximated and sutured. (4) Approximation of the palatal flaps and insertion of the sutures. Fine silkworm gut is used, and the sutures are of the mattress type; the anterior edges of the flaps are first approximated. (5) Approximation and fixation of the maxillæ (*Fig. 36*). (6) Tying of the sutures in the palatal flaps. The *after-treatment* is simple. Water is given immediately, and milk feeding is permitted within twelve hours. The maxillary silver-wire suture is removed at the end of three or four weeks, while the palate sutures separate spontaneously or are removed in four or five weeks. In regard to the age for operation, the author expresses a preference for a period between 12 and 18 months.

This operative procedure has certain attractions, and its strongest claim for consideration lies in the use of the septal flap. The majority of pediatric surgeons will agree that in the alveolar cleft palate the real difficulty in closure arises in connection with the anterior extremity of the cleft; it is here that tension imperils the suture line, and it is in this situation that the laxity of a septal flap may ensure a successful union. A more debatable point is in regard to the use of the maxillary suture; it is a procedure which has never found favour in this country except in the modified form in which it is used to retain the proper alinement of a projecting premaxilla, and the reason of its unpopularity is its liability to be the cause in the later years of childhood of a distressing lack of the forward progression of the maxillæ. Its liability to interfere with the developing teeth is of minor consequence when compared with the facial disfiguration.

G. V. I. Brown² is opposed to any procedure which is likely to entail injury to the premaxilla and alveolar outline. He believes that as soon after birth as conditions permit the cleft palate should be closed, with simultaneous reconstruction of the deformed nose to ensure nasal breathing. At from six to eight months the posterior portion of the palate cleft is closed by the method outlined below, and one year later any persisting defect is remedied. The paper deals with the technique of the first-stage palate operation. Brown has abandoned the mucoperiosteal flap (Langenbeck) for the following reasons: (1) Uncertainty of the blood-supply; (2) The necessity of dividing the fibrous band and muscular attachment to the posterior extremity of the hard palate; (3) The post-operative scar contraction which is apt to ensue; (4) The liability to sloughing; (5) The liability of injury to the flap during the process of separation.

It is believed that these objections have been overcome by adopting what is termed a 'Bone-flap' Method. The procedure is as follows: Antero-posterior incisions are made on both sides of the palate along the line of and just inside the alveolar ridge in edentulous cases; just sufficiently far away from the palato-alveolar border to prevent injury to the roots if teeth have

been erupted. A chisel is now forced through the external hard surfaces of the fragmentary palate-bone structure into the cancellous tissue, and then inclined towards the palatal fissure border (*Fig. 37*). Occasionally it is necessary to direct the chisel backwards in order to divide the palate bones. Hæmorrhage is arrested by gauze packing. Inward and slightly upward pressure of

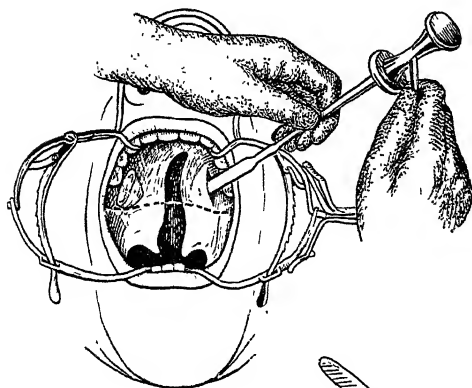


Fig. 37.—G. V. I. Brown's bone-flap method in cleft palate. First step: Chisel is shown as used in separating the bone fragments, and the packing inserted to control hæmorrhage on the opposite side. (*Figs. 37-39* redrawn from the 'Journal of the American Medical Association'.)

Fig. 38.—Brown's operation in cleft palate. Passing the silkworm suture through the opening and around the separated bone and overlying tissue, to be passed again in the same way to enclose the bone flap on the opposite side.

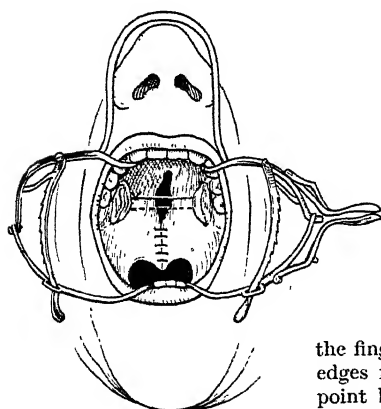
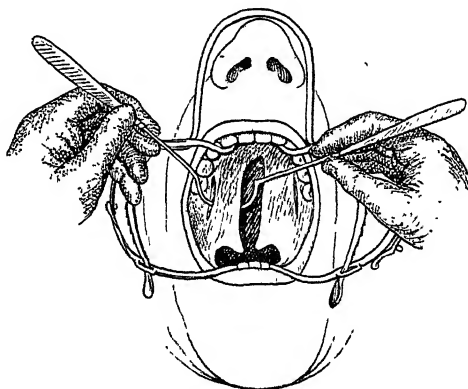


Fig. 39.—Brown's operation for cleft palate. The double suture enclosing the bone fragments, and tied, allowing the edges to be pared and the palate sutured.

the fingers completes the fracture, and the cleft edges may now be brought into contact at a point between and slightly anterior to what in normal cases would be the outline of the soft palate. A curved needle carrying two strands of silkworm gut is passed into the incision on each side of the palate through at the point of fracture of the bones into the fissure and out through the similar bone separation on the opposite side (*Fig. 38*). The double suture then encloses the bone fragments,

and when tied in the centre holds the parts so that without fear of tension the edges may be pared and the palate may be sutured from the tip of the uvula up beyond the posterior part of the hard palate, and sometimes through its central portion (*Fig. 39*). The lateral incisions are packed with collodion-painted gauze, and, if the pressure of the pack should interfere with breathing, nasal catheters are passed and, if necessary, left *in situ* for some days.

The result of the operation is to close the velum and the posterior part of the cleft in the hard palate, leaving the anterior defect to be dealt with at a later date. It has been Brown's experience that as a result of the closure of the posterior part of the palate error the remainder of the cleft becomes so reduced that further operation is often unnecessary. The author is frank about the disadvantages—in weakly children the section of the bone appears to be associated with a considerable measure of shock, hæmorrhage is sometimes troublesome, and, should heavy packing become necessary, the nasal obstruction gives rise to distress and even to high temperatures.

An attractive feature of the operation is the avoidance of the severing of the attachments of the soft palate to the posterior edge of the hard. There is no doubt that this step is a drawback in the mucoperiosteal methods of Langenbeck and Warren, and in the modification as practised by Berry. When all is said and done, the real value of cleft-palate operations will be judged by their influence in correcting speech errors. It seems that for this correction a long mobile soft palate is a necessity, and any separation of the musculature of this organ from its attachments is likely to be followed by shrinkage and interference with both the mobility and motility of the organ. It is in the avoidance of this complication that Brown's method is particularly attractive.

H. P. Ritchie³ strikes a somewhat original note in his article '*Congenital cleft lip and palate*'. The collective title is somewhat of a misnomer, for in point of fact the observations are confined to the lip deformities. After pointing out that the body of the lip is mainly composed of orbicularis oris muscle, all other tissues being mere coverings for this structure, the importance of the muscle is emphasized; it is spoken of as the 'key ring' of all the expression muscles of the face. Ritchie believes that, if the best æsthetic and functional results are to be obtained in the correction of lip clefts, the upper and lower margins of the muscles on the opposing sides of the cleft must be united in exact approximation. In order to define the various cardinal points with reasonable accuracy, the muscle is stimulated by the faradic current of a one-dry-celled battery (*Fig. 40*). Ritchie claims that by this means he is able to define accurately the limits of the contracted tissue. Thereafter, the lip having been put on the stretch and the muscle borders marked by small nicks, the mucous membrane is dissected back as a flap, thus exposing the sphincters in position for lateral approximation to the muscle of the opposite edge, which is exposed in a similar way (*Fig. 41*). Accurate approximation of the opposing muscle edges by vertical mattress sutures (*Figs. 42, 43*) is the distinctive feature of the operation, though in the complete cleft an additional plastic section is required to complete the nostril floor.

Such is the basis of the procedure which Ritchie recommends. There is no doubt that, if the best results are to be obtained, surgical procedures should be so designed as to restore the affected parts to normal as far as this is possible, and in this respect Ritchie's operation attempts to fulfil the ideal; but it is open to question whether such technical detail is necessary. In the operative procedures usually adopted, as, for example, Malgaigne's and Mirault's methods or in the Rose operation, the paring of the cleft edges exposes the muscle, and

with accurate suturing of the lip tissues as a whole there must be reasonably true approximation of the muscle portion. Moreover, the process of healing between opposing muscular surfaces is after all largely a question of fibrous-tissue formation.

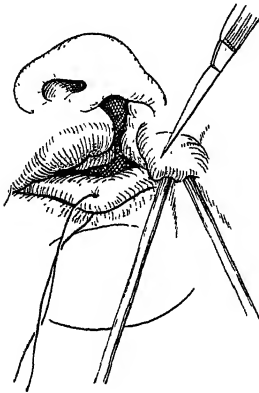


Fig. 40.

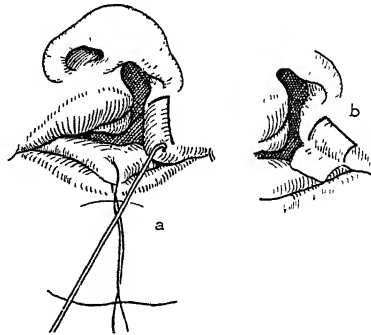


Fig. 41.

Fig. 40.—H. P. Ritchie's operation for hare-lip. Under stimulation the muscle contracts to almost a right angle. Out on the mucous membrane the lower border is shown. This point is indicated by the knife-point. (Figs. 40-43 re-drawn from 'Annals of Surgery'.)

Fig. 41.—Ritchie's operation for hare-lip. (a) With the lip pulled out on the stretch, a perfectly straight line incision is made connecting the point on the skin above to the point on the mucous membrane below. While on the stretch the mucous membrane is carefully dissected backward, as a flap, as shown in (b). Thus exposes the contractile tissue which was determined under contraction. The same procedure is followed on the other side.



Fig. 42.

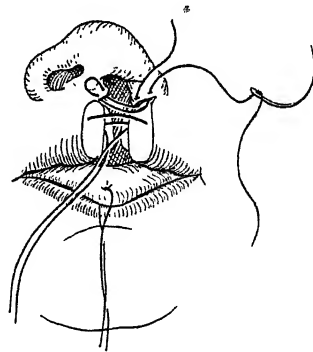


Fig. 43.

Fig. 42.—Ritchie's operation for hare-lip. Any mobilization of the ala should be done after the denudation of the short side. When this procedure is done, two surfaces appear that are equal in length and width, in perfect position for lateral union. The author is unable to make them as perfect as shown, but that is his purpose. The stitch shown is most important, and should include the very upper fibres of the muscle. It is this stitch that determines the degree of rotation of the ala

Fig. 43 —Ritchie's operation for hare-lip. The top muscle stitch is pulled down, and a lateral mattress placed in the denuded area of the ala and the epithelial reflection at the base of the columella. This reflection is up in the nostril. In the drawing it looks as though it was upon the lip. In all adults, the nostril has a floor of definite length, which is nearly at right angles to the lip. Two other muscle stitches are placed, and the skin incision is closed.

Harold S. Vaughan⁴ is a disciple of the 'early operation' school. He states : "In the treatment of complete congenital clefts of the lip, alveolar border, and palate, the operation for repair should be performed as soon after birth as the baby's physical condition will permit." Two arguments are advanced in support of this declaration : (1) That young infants stand operative procedures well, and are not so subject to shock as when older ; (2) That the bones are softer and more pliable before the third and fourth months. The first of these statements is one very frequently expressed, but there is considerable doubt regarding its accuracy. It is difficult to formulate a substantial explanation of such a peculiarity, and practical experience has led the reviewer to be peculiarly apprehensive of shock in the infant.

The author advocates that the remedial process be begun by closure of the alveolar cleft. This is secured by digital pressure and manipulation, followed by the insertion of an 18-gauge silver wire through the maxillæ above the level of the palatal processes (Fig. 44). The free ends of the wire are carried round the outer surfaces of the maxillæ in the alveolar-labial fold, and tightened so as to hold the opposing surfaces of the alveolar cleft in apposition (Fig. 45).

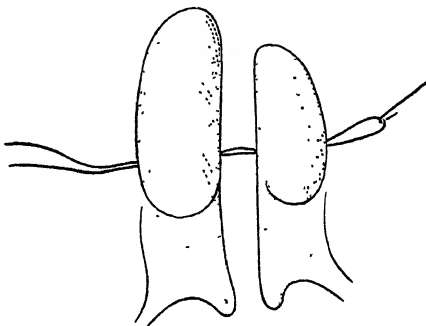


Fig. 44.—H. S. Vaughan's 'early operation' method in cleft palate. Silver wire being drawn through maxillæ. (Figs. 44-48 re-drawn from 'Annals of Surgery'.)

The free ends of the wire are carried round the outer surfaces of the maxillæ in the alveolar-labial fold, and tightened so as to hold the opposing surfaces of the alveolar cleft in apposition (Fig. 45). The closure of the lip is thereafter proceeded with on the Rose plan. It is advised that calipers be employed in the accurate measuring of the opposing

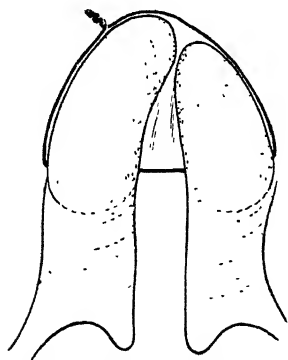


Fig. 45.—Vaughan's method in cleft palate. Silver wire approximating anterior portion of maxillæ.

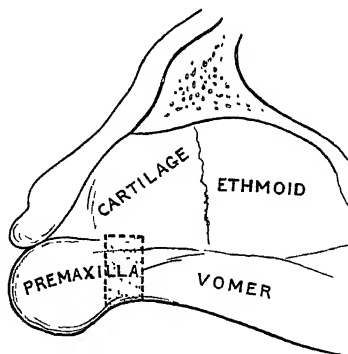


Fig. 46.—Vaughan's method in cleft palate. Quadrilateral section of septum for excision.

edges, and we are in full agreement with the value of this advice. When the deformity is one of bilateral cleft lip and cleft palate the correction is undertaken in a series of stages. The first stage consists in the correction of the malposition of the premaxillary bone and its adjustment and fixation between

the separated halves of the maxilla. To secure this the maxillæ are transfixed by a silver wire as above, the mucous membrane of the anterior extremity of the free edge of the vomer septum is divided and separated labially, a *quadrilateral* segment of the bone is then removed from an area immediately posterior to the premaxilla (*Fig. 46*), and the premaxilla is carried posteriorly into its correct relation. The removal of a *triangular* segment from the septum is the technique usually adopted. Vaughan criticizes this as tending to result in a backward tilting of the premaxilla, with subsequent distortion of the axial relation of the teeth.

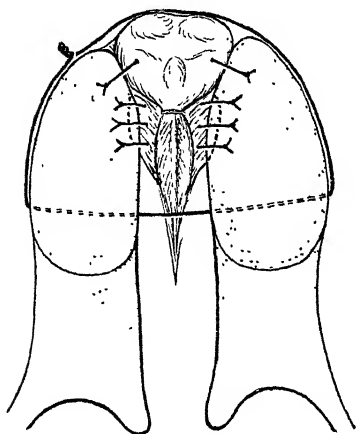


Fig. 47.—Vaughan's method in cleft palate. Premaxilla held in position, and flaps from sides of septum sutured to palate.

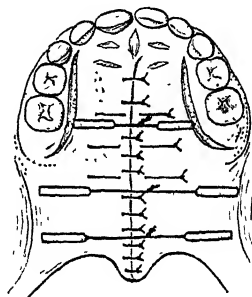


Fig. 48.—Vaughan's method in cleft palate. Flat silver wire sutures in position to relieve tension on suture line and for immobilization of soft palate.

The edges of the premaxilla and the alveolar cleft having been fastened, the parts are approximated and held in position by carrying the cross-maxillary wire through the soft tissue on the anterior surface of the premaxilla. At this stage a detail of considerable value is carried out. It was originally suggested by Tichler, and it consists in the suturing of the free edges of the separated septal mucous membrane flaps to the edges of the anterior portion of the palate cleft (*Fig. 47*). The lip cleft and the remaining portion of the palate cleft are closed at subsequent dates, though no exact indication is given of the intervals of time which should elapse between the various operations. In both the lip and the palate operation considerable use is made of tension suture. In the palate particularly the Mackerty lead ribbon and flat silver wire sutures are used (*Fig. 48*). The point in this paper upon which criticism will centre is the use of the transmaxillary suture, the disadvantages of which have already been alluded to.

Mackenzie Forbes⁵ raises the question of the order in which the different operations should be carried out in a combined cleft-lip and cleft-palate deformity. He concludes "that it is best to abstain from closing the lip until the palate has been treated to a conclusion." The decision is an unusual one, and its justification is stated to be "because it is desirable to have as much room as possible in which to operate on the palate." The author believes that theoretically it is advisable to operate on the palate about the beginning of the second year—we assume that the theory is put into practice. He proceeds to ask, Can nothing be done during these twelve or fifteen months to prevent further deformity, and presumably to make the subsequent operation a simpler

procedure than it would otherwise be? The result of the question has been to adopt the principle of gradual transmaxillary pressure exerted through the medium of metal plates and wires. The technical details as quoted in this paper are not clear, but it is evident that moulded German-silver plates superimposed upon lead plates, and silver wires cut with a thread and provided with nuts, are the means used to exert the pressure. There is a suggestion that the tension should be exerted obliquely across the palate from a position posterior to each canine tooth to a position anterior to the last bicuspid tooth of the opposite side," and vice versa, but it is not clear that the procedure is put into practice. The article concludes with the somewhat cryptic remark: "Is there, however, any perfect operative procedure for the relief of the most distressing deformity of cleft palate, and is there anything new under the sun?"

Professor William Rankin⁶, writing on hare-lip and other developmental lesions of the face, groups the varieties of hare-lip as follows: (1) Unilateral or bilateral; (2) Incomplete or complete, according to whether the cleft passes into the nostril or not; (3) Alveolar, when there is a break in the continuity of the alveolar margin; (4) Complicated, when the lip deformity is accompanied by a cleft palate or other associated defect.

In the single incomplete hare-lip the Malgaigne operation is recommended; when the deformity is of the unilateral complete variety, Mirault's operation is preferred. In dealing with an alveolar hare-lip the author divides the operation into two stages. The first consists in paring the alveolar cleft edges, drilling the opposing alveoli and introducing a silver-wire suture, severing with bone forceps the projecting alveolus and the anterior part of the maxilla distal to the wire, levering the loosened fragments into position, and holding them so by tightening and twisting the wire suture. At the end of ten to twelve days the wire is removed and the lip closure completed. The procedure as described sounds somewhat heroic. To divide the alveolar margin lateral to the cleft with bone forceps and thereafter to submit the mobilized segments to the pressure of an encircling silver wire would seem at first sight to imperil the vitality of the segments with their related tooth-buds, and also to distort unduly the configuration of the parts. It is, however, by results that judgment must ultimately be assessed, and Professor Rankin is evidently satisfied with the value of the method which he describes.

At the Royal Society of Medicine last year,⁷ Sir James Berry opened a discussion on the operative treatment of cleft palate, and his remarks were based upon an experience of thirty-three years and 276 cases. He pointed out a truism which is often forgotten, that the sole object of operating on cleft palate is to make intelligent speech possible; the examples in which operation is necessary in order to allow the child to be nourished are exceedingly rare. The age of election for the operation was put at one and a half to four years, exception being made in the instance of the narrow cleft of the soft palate, where approximation can be secured with safety a few weeks after birth. The method favoured was that of lateral approximation after separation of the mucoperiosteum, avoiding, if possible, the use of lateral relief incisions; and the greatest importance was attached to the closure of the soft palate, assuming that this organ remained lax, mobile, and efficient.

In the discussion which followed, it was interesting to learn that the flap operation of Arbuthnot Lane gives good results in the hands of those who practise it. Mr. C. H. Fagge, for example, stated that he had never failed to close a hard palate with a Lane's flap, nor had he seen one break down. The consensus of opinion evoked may be summarized in the following points: (1) That if a hare-lip deformity accompanies a cleft palate, the lip deformity should be dealt with first. (2) That the ideal age for operative interference

is at some time between one and three years. (3) That the lateral approximation method of Langenbeck ensures the best results. (4) That any method which involves the use of compressing metal sutures has serious disadvantages. (5) That the ultimate value of any cleft-palate operation will be judged by the functional efficiency of the soft palate and the completeness with which speech defects are corrected.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1926, Oct. 23, 1384; ²*Ibid.* 1379; ³*Ann. of Surg.* 1926, Aug., 211; ⁴*Ibid.*, 233; ⁵*Canad. Med. Assoc. Jour.* 1927, Jan., 76; ⁶*Glasgow Med. Jour.* 1926, Dec., 350; ⁷*Lancet*, 1927, June 11.

HEAD INJURIES.

Geoffrey Jefferson, M.S., F.R.C.S.

Infection after Cranial Injury.—It is common knowledge that a fracture of the skull, and particularly one which implicates the cranial base, is apt at times to be followed by meningitis; and so serious is this complication when it does occur, that few survive it. The means by which infection reaches the skull is not, perhaps, so widely understood as it should be. Basal fractures involving the anterior and middle fossæ are generally compound, the mucosa lining the vault of the nose and pharynx being torn and the bone fissure open to the air. Fortunately the dura remains intact as a rule, for it is by no means so intimately adherent to the bone in the living subject as the student is likely to believe from his dissecting-room experience with formalin-hardened material. It is tacked down to the base by issuing nerves and entering vessels. This is particularly well seen in the olfactory grooves, and fractures which cross these grooves from one orbit to the other may easily be complicated by dural tears, and the entry of bacteria from the nose or ethmoidal cells. The thin posterior wall of the frontal air sinus when broken may also cut the dura, and many cases of intracranial aerocele have now been recorded. In many of these the air has remained sterile and good recoveries have been made. So fortunate an outcome cannot always be expected, and F. R. Teachenor¹ mentions 10 cases in which involvement of a cranial air sinus has resulted in intracranial infection and death. It is interesting to note the relative frequency of injury of the various sinuses: frontal sinus, 6, ethmoid 1, sphenoidal sinus 1, mastoid and middle ear 2. Fractures involve the petrous bone so often that it is surprising perhaps how rarely infection follows. Most clinicians have had under their care cases in which blood and cerebrospinal fluid have escaped from the ear, and more rarely from the nose, and the patient has nevertheless done well. It would appear that frontal-sinus injuries are particularly dangerous, and may often occur in linear fractures of the vault which run down into the base (a common finding, of course, for fractures limited purely to the base are rare) in the anterior fossa. The frontal air sinus is normally sterile; but when blood trickles down from the injured sinus into the nose and obstructs the air-way, the patient sneezes or blows his nose and forces infective material up into the sinus, where it finds a pabulum in the clotting or clotted blood.

Teachenor has had an exceptional experience of fractures involving the sinus, having treated 16 cases in one of which the posterior wall was broken whilst the anterior remained intact. Of the first 8, 3 came to operation, but only when complications had already arisen. In the second series of 8 cases all were operated upon, with 3 deaths, as against 7 in the first. The operation performed consists in draining the frontal sinus by perforating its anterior wall and inserting an external drain. The recoveries following this procedure equalled the fatalities in the first series, 67·5 per cent. The object of this very simple operation is to allow easy exit to any air forced up from the nose, and at the same time blood is drained away. The tube is left *in situ* for a week.

The diagnosis is made essentially by X-ray examination, the fracture line

being traced and the sinus being rendered opaque by blood-clot. Epistaxis is the one constant sign, Teachenor thinks, but it is surely so common that one would hesitate to attach too much importance to it. It should serve, however, as a warning, and skiagrams should be taken at once, for if treatment is to be of use it must be undertaken without delay and without waiting for signs of infection.

One cannot help feeling that Teachenor's experience has been a little unusual, for in a large series of head injuries the reviewer has not found infection to be a common sequela. A more rational operation would be to strip the dura from the back of the sinus through a rather larger and higher opening, and suture or patch with fascia the dural laceration as has been done in aerocele cases (see also Cushing on orbito-ethmoidal osteomata.)

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1927, March 26, 987.

HEART, THE ACTION OF DRUGS UPON. *A. G. Gibson, M.D., F.R.C.P.*

The efficacy of *Digitalis* and of the *Xanthin Derivatives* in *congestive cardiac failure* was investigated by H. M. Marvin¹ in a series of 77 patients properly chosen and controlled. All the patients after a preliminary rest were given full doses of *digitalis*. If after several days the amount of oedema remained stationary, the patient was given one of the xanthin derivatives, theobromine sodiosalicylate, theobromine, theophyllin (theocin), in a fixed dose thrice daily for several days depending on the drug, and repeated after an interval of some days. In the more refractory cases all drugs were tried. Of the 77 patients, 36 (46 per cent) were rendered oedema-free by *digitalis* alone; of the remaining 41, 13 (16 per cent) were made free of oedema by one or more of the xanthin derivatives. Theophyllin is the most potent of the drugs used, but its defect lies in the nausea and vomiting that it produces.

The same author² has made a study of the relative efficiency of *Novasurol* and *Theophyllin* in reducing the oedema of congestive cardiac failure. In a series of 17 cases in which both drugs were used, both failed to act in 8 cases. In 4 cases, 3 rheumatic and 1 syphilitic heart disease, neither drug had any action. Amongst the 8 cases belonging to the arteriosclerotic group there was no case in which one or the other drug failed to act. *Novasurol* is a double salt of sodium oxymercurichlorophenyl oxyacetate with diphenyl-barbituric acid, and was introduced as a mercury salt for the treatment of syphilis. The dose usually employed is 0.75 to 2 c.c. of a 10 per cent solution by the intramuscular or intravenous route. It is usual, because of its toxic properties, to inject a small dose first and afterwards the full dose. The danger of mercurialism is by no means negligible, for of Marvin's 17 cases 5 had stomatitis. It is therefore advised that *novasurol* should be given only after *digitalis* and the xanthin derivatives have failed.

A. W. Jacobsen and W. C. Davidson³ find that severe *myocardial failure in children* is best treated by *Digitalis*. They prefer the dried leaves, and give one $\frac{1}{2}$ gr. (0.05 grm.) per pound of body weight, and a subsequent daily dose of 3 gr. (0.2 grm.). This last dose may be given every six hours in children suffering from decompensation until nausea is produced; less frequent doses will be required to keep the patient under the action of the drug.

J. Wyckoff and W. Goldring⁴ made a study of the intravenous injection of *Ouabain* (strophanthin gamma) in 32 patients with *cardiac failure*. They gave 248 injections without any fatalities or harmful effects. The initial effect is noticed in 15 to 50 minutes. More doses were required in those patients who had auricular fibrillation with elevation of temperature than in those without pyrexia. The persistence of the action of the drug was never longer than five days. Mild toxic symptoms were noticed in some

patients when full doses were used. Care is required in treating patients with regular rhythm, and clinical improvement is the criterion for the therapeutic effect. In moribund patients who may show no improvement there is greater danger of an over-dose. The preparation used was that of Lily and Co., put up in ampoules, each of which contained 0.5 mgrm. in 2 c.c. of solution. The method adopted was to give the patient an initial dose of 0.5 mgrm., followed every half-hour by 0.1 mgrm. until a slowing of the pulse occurred which persisted. The critical pulse-rate was taken as 80.

K. Doll⁵ urges the use, not only in hospital but in private practice, of intravenous injections of *Strophanthin* for the treatment of all the more resistant forms of *cardiac failure*, and for *cardiac asthma*. After a long experience he is of the opinion that fatalities from its use are to be ascribed to a lack of adherence to the rules of dosage. The therapeutic intravenous dose of *strophanthin* (K-strophanthin Boehringer) is 0.5 mgrm., a dose which can be repeated daily for a time. All patients must be accurately watched as regards pulse, breathing, diuresis, and if possible weight, for it is essential to be guided in the dosage by the improvement or the reverse in the patient, and to lessen the dose or the interval if improvement is clear. Painful infiltrations outside the vein, from failure to inject into the vein or from leakage, are to be avoided by practice and by having sharp and smooth needles. *Strophanthin* therapy does not interfere with other measures, such as diuretics, for the relief of edema. It is particularly useful in the worst type of congestive failure; patients thus treated, in the words of the author, "live longer, suffer less, and die easier".

Cardiazol is a very efficient *cardiac tonic in children* as described by A. Mertz and E. Eschbacher.⁶ *Cardiazol* is pentamethylentetrazole, has a high solubility in water, and is absorbed with great rapidity after subcutaneous injection. It may be given without danger, and acts in regulating not only the frequency and force, but also the stroke, of the heart; it also acts on certain irregular forms of pulse. The blood-pressure is increased. Infants can stand a dose of 0.4 c.c. of a 10 per cent sterile solution, or it may be given as a tablet of 0.05 grm. Older children may be given a dose of twice this amount, which is the dose used for adults. The dose may be given twice or thrice daily, and the same effect may be obtained later by lessened doses. The authors have found it specially useful in the acute infections such as diphtheria, measles, influenza, whooping-cough, and bronchitis. In some children, such as those affected with rickets and after several days' use of the drug, there may be spasms of the limb muscles. G. Pickler⁷ recommends *cardiazol* (Knoll) for a variety of *acute and chronic circulatory failure*. The single dose recommended is 0.1 grm. or less. The pulse tends to become slower; in patients with normal or low pressure the systolic pressure rises, as does the pulse-pressure. It is apparently equally effective whether given intramuscularly or by mouth.

N. Sidel and F. G. Dorwart⁸ report a series of 20 cases of *fibrillation* of various etiology treated by *Quinidine*. In 13 of these the normal rhythm returned. No case with a cardiac history of two years or less failed to be restored to the normal rhythm under quinidine sulphate. They recommend much larger doses than are ordinarily given by gradual increases. In one case the daily dose reached was 200 gr., and the total amount given over the period in another case was 920 gr. The highest single dose was 45 gr. Quinidine was not looked upon as a drug for treating cardiac failure, but merely for altering the rhythm. Digitalis had been used in all cases. The large doses here recommended are only to be attained by gradual stages and under proper hospital supervision. In no case were there any serious symptoms.

F. W. Price⁹ takes a more restricted view of the value of quinidine, or, rather, considers that its dangers are not to be gainsaid. There are general toxic

symptoms such as headache, giddiness, transitory visual or aural disturbances, nausea and vomiting, to name but a few; cardiac failure and sudden collapse may also occur, usually from the detachment of a clot from some part of the endocardium, especially the auricular appendices. The effects of quinidine on the heart in patients suffering from persistent auricular fibrillation are (1) a progressive diminution in the auricular rate, (2) a simultaneous increase in the ventricular rate, and (3) a sudden cessation of the auricular fibrillation with a return to the normal rhythm. Quinidine is most likely to be successful in cases of persistent auricular fibrillation or persistent auricular flutter in which there is either absence, or only a moderate degree, of valvular or myocardial disease. About half the cases treated return to a normal rhythm, but in some there is danger of a relapse of fibrillation. The contra-indications to its use are the presence of a severe grade of valvular defect, widespread myocardial degeneration, great enlargement of the heart, or a severe degree of cardiac failure. All cases should be treated first by digitalis, and the patients should be confined to bed. It is advisable to give a preliminary dose of 5 gr. to test for a possible idiosyncrasy. The drug may conveniently be given in gelatin capsules, and Price advises a dose of not more than 50 gr. per diem.

L. F. Bishop¹⁰ recommends the use of quinidine in doses of 2 gr. three times a day for recurring extra-systoles, which so often, without any real cardiac disturbance, interfere so much with the comfort of the patient.

Otto and Gold¹¹ studied the effects of Adrenalin, Quinine, Quinidine, Atropine, and Digitalis in a patient subject to attacks of auricular paroxysmal tachycardia. The most important results were that adrenalin induced a paroxysm; that it could be prevented by paralysing the vagus by atropine. Digitalis had no effect either in inducing or inhibiting an attack. Quinidine administration prevented spontaneous attacks as well as those induced by adrenalin.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1926, Dec. 18, 2043; ²*Ibid.* Sept. 25, 1016; ³*Amer. Jour. Dis. Child.* (abstr. *Jour. Amer. Med. Assoc.* 1926, Oct. 30, 1506); ⁴*Arch. of Internal Med.* 1927, April, 488; ⁵*Munch. med. Woch.* 1926, Aug. 27, 1437; ⁶*Ibid.* Aug. 6, 132; ⁷*Wien. klin. Woch.* 1926, Aug. 19, 964; ⁸*Boston Med. and Surg. Jour.* 1927, Feb. 10, 216; ⁹*Practitioner.* 1927, May, 294; ¹⁰*Therap. Gazette.* 1926, Aug., 554; ¹¹*Amer. Heart Jour.* (abstr. *Jour. Amer. Med. Assoc.* 1927, Jan. 15, 199).

HEART DISEASE. (See also ANGINA PECTORIS; ARRHYTHMIA AND CARDIOGRAPHIC CHANGES; HEART, ACTION OF DRUGS ON; HEART FAILURE; HEART, RUPTURE OF; HEART, VALVULAR DISEASE OF; PERICARDITIS; SYPHILIS, CARDIOVASCULAR.) A. G. Gibson, M.D., F.R.C.P.

The Science Committee of the British Medical Association¹ have issued a report on the *prevention and control of rheumatic infection in children*. Amongst many points of interest the following may be noticed. The report lays stress on the problem being one of a systemic infection and not that of a static disease of an important organ. It urges that treatment should wherever possible be in the hands of private practitioners. Also where possible the detection of cases should be assisted by various public health authorities whose business it is to deal with children. It is against the formation of large institutions specially for the treatment of rheumatic heart disease. Sections of the report deal with damp dwellings and the provision of rest homes or wards in connection with existing hospital notification. It urges the medical supervision of rheumatic children by the existing hospital staffs, the formation of a 'rheumatism register', and periodical examination. It advises against the institution of special rheumatism treatment centres.

The effects of *exophthalmic goitre on the heart* are discussed by J. S. Goodall and Lambert Rogers² in reporting a case of death from this disease. The pathological changes found in the heart muscle are: (1) Hyaline degeneration and

necrosis of many bundles of fibres scattered throughout the myocardium ; (2) Migration of phagocytic cells towards the necrosed fibres, more marked in some places than in others. As to the electrocardiographic findings in the case reported, the P and T waves tend to be of the same height, whereas normally the T wave is higher than the P. The same authors, in another paper,³ review the electrocardiographic manifestations in 787 cases of thyrotoxic hearts ; 242 showed impaired conduction, 184 left-sided preponderance, 113 a modification of the T wave in Lead III, 108 cases showed a right-sided preponderance, 91 cases auricular fibrillation ; other modifications were also found.

J. E. Wood, T. D. Jones, and R. D. Kimbrough⁴ analyse 623 cases of heart disease from the *etiological standpoint*. Taking the main subdivisions and omitting subsidiary factors, 39.85 per cent belonged to the rheumatic group, 32.78 per cent to the arteriosclerotic, 36.79 per cent to the hypertensive, 6.77 per cent to the syphilitic, and 5.63 per cent to the thyroid. This analysis was made on two series of cases : 300 belonged to Virginia, and included negroes as well as whites ; 323 cases were from the medical service of the Massachusetts General Hospital. From this analysis it appears that heart disease is almost twice as frequent in the negro as in the white, and this increase is due to hypertensive and syphilitic heart disease. Whereas cardiosclerosis accounts for 10 per cent of heart disease in negroes, it amounts to 23 per cent in whites. Rheumatic heart disease forms 11 per cent in the negroes of the first series ; it forms 28 per cent in the whites. Osler and Weir Mitchell have both noted the rarity of chorea amongst the coloured race. Angina pectoris is also much less common. Rheumatic heart disease is almost twice as common in Massachusetts as in Virginia, and it increases northwards in the eastern part of the United States. Touching the etiology of chronic valvular disease, of 59 cases of pure aortic regurgitation, 59.3 per cent were syphilitic, 25.4 per cent rheumatic, and 15.3 per cent arteriosclerotic. This last figure is remarkably high, despite every care in diagnosis. Other observers' figures vary from 2.2 per cent to 10 per cent.

In an analysis of 30 cases of *subacute bacterial endocarditis*, W. L. Bierring⁵ found a previous rheumatic infection in 20 ; there was a positive blood culture in 27. In 26 Osler's nodes and petechiæ were present, and all cases showed an enlarged spleen and acute glomerular nephritis as determined by microscopical examination of the urinary deposit. Six cases only were active at the time of writing, and none of these had been under observation for longer than eighteen months.

E. Czyhlarz⁶ records an interesting observation on *clubbing of the fingers* present in conditions of the heart and lungs leading to peripheral stasis, especially in subacute infective endocarditis. Czyhlarz finds it also in aortic insufficiency, especially in that due to syphilis, quite apart from cardiac failure or venous stasis. In these cases he attributes the phenomenon to the increased nutriment supplied to the part as indicated by the rapid and large pulse and by the capillary pulsation. Another associated phenomenon is an increase in the length of the finger, all three phalanges being implicated. The increased growth in the finger only takes place during the period of active growth of the individual, and therefore the date of onset of the endocarditis may sometimes be fixed in after life.

F. J. Poynton and W. G. Wyllie⁷ report an unusual case of a male child, age 3½ at the time of writing, who from shortly after birth has been the subject of attacks of various types ; in the minor forms he "drew himself up into a ball, screamed, and went blue round the mouth", symptoms which in the first were attributed to indigestion. In the longer attacks he became rigid.

Other symptoms were breathlessness, vomiting, cyanosis, and distention of the veins at the root of the neck. In the period of recovery from these attacks there was extreme listlessness, extensive pulsation of the precordia, and great enlargement of the heart. The pulse might be uncountable at the onset of an attack, but slowed down during a period of several days, rates of 250 to 100 being frequently recorded in the period. Many varieties of cardiac irregularity occurred as judged by the pulse, except pulsus alternans. John Parkinson had been successful in obtaining an electrocardiograph which showed auricular flutter. The boy had passed through an attack of acute cardiac failure, one of bronchopneumonia, and one of tonsillitis, and at the age of $3\frac{1}{2}$ was normally grown, of a good colour and of normal mentality, apart from the attacks, though with a hypertrophied heart. There was no etiological factor to be discovered, and though the child was improving generally no drug had any permanent effect. The authors believe that the case belongs to that class of idiopathic hypertrophy described by Howland in 1919. There are so many points of interest in this important and well-written paper that it should be consulted in the original.

R. D. Rudolf⁶ treats of the *immediate and the ultimate prognosis* in cardiac disease. The immediate prognosis, as in pneumonia, may be bad, yet if the patient weathers the attack it may be good; and, on the other hand, as in rheumatic fever, the immediate prognosis may be good, yet the ultimate may be very bad. The first requisite of prognosis is an accurate diagnosis. Functional disturbances carry a good prognosis, as for instance D.A.H. during the war. The functional patient complains of his heart, in marked contrast to him with organic disease, who complains of his breath or of the cedema of his legs. Though a temporary toxæmia as in Graves' disease or diphtheria may be very serious, the heart when relieved of the poison has a marvellous power of recuperation. Of disturbances of rhythm, sinus arrhythmia is of no significance. Extra-systoles are similarly of little significance, unless accompanied by other signs. Auricular fibrillation may be a passing condition as in Graves' disease, but apart from this "it is a bad mark in the patient's history, and usually means that he is far on the road towards death". Auricular flutter means a degeneration of the auricular myocardium, and is therefore serious; especially is this so if attacks of paroxysmal tachycardia occur, which indicate a removal of the partial heart-block that is usually present as well. Heart-block, apart from toxæmias and digitalis poisoning, means a myocardial affection, and the prognosis depends on its extent. Located to the bundle alone, its chief disability is the syncopal attacks, but these in themselves are not necessarily serious, and the author has observed one case for fifteen years with a disappearance of these attacks.

In acute infections, such as rheumatic fever, it is the extent of the myocardial disease that determines the result. Infections by *Streptococcus hæmolyticus*, pneumococcus, staphylococcus, and gonococcus are usually fatal. Cardiac affections in early syphilis carry a good prognosis if the patient can stand specific treatment. Tertiary cases usually succumb within five years after cardiac symptoms have set in. As to chronic organic disease, systolic murmurs have little significance in the absence of other signs. Signs of mitral stenosis are of grave import, and such patients seldom reach the age of 50. Hypertrophy is a compensatory factor to overcome a cardiac load, and is a means of restoring the cardiac reserve estimated by the patient's capacity to undergo exertion. Prognosis in cardiac disease must be based on a complete review of the patient's history, family history, as well as his present physical signs and cardiac reserve. The prognosis in patients who develop bigeminy during the administration of digitalis is in general poor, but the bigeminy does not

give a graver outlook than that obtained by tests for the functional capacity of the heart (Gold and Otto). Gain in weight in young patients with cardiac disease is a sign of favourable progress, and should be used both as such and, if there be loss, to anticipate relapses (McCulloch).

REFERENCES.—¹*Brit. Med. Jour.* 1927, April 16, 121; ²*Lancet*, 1927, i, 486; ³*Brit. Med. Jour.* 1927, i, 1141; ⁴*Amer. Jour. Med. Sci.* 1926, Aug., 185; ⁵*Jour. Amer. Med. Assoc.* 1926, Aug. 14, 464; ⁶*Wien. klin. Woch.* 1926, July 22, 863; ⁷*Lancet*, 1926, ii, 371; ⁸*Canad. Med. Assoc. Jour.* 1927, Jan., 11.

HEART DISEASE, CONGENITAL.

A. G. Gibson, M.D., F.R.C.P.

Coarctation of the aorta (stenosis of the isthmus), though a rare condition, is one which should be borne in mind in anomalous cases of excessive arterial pulsation. J. T. King¹ has given a comprehensive review of the condition, with four new cases and a full bibliography. It occurs more often in males

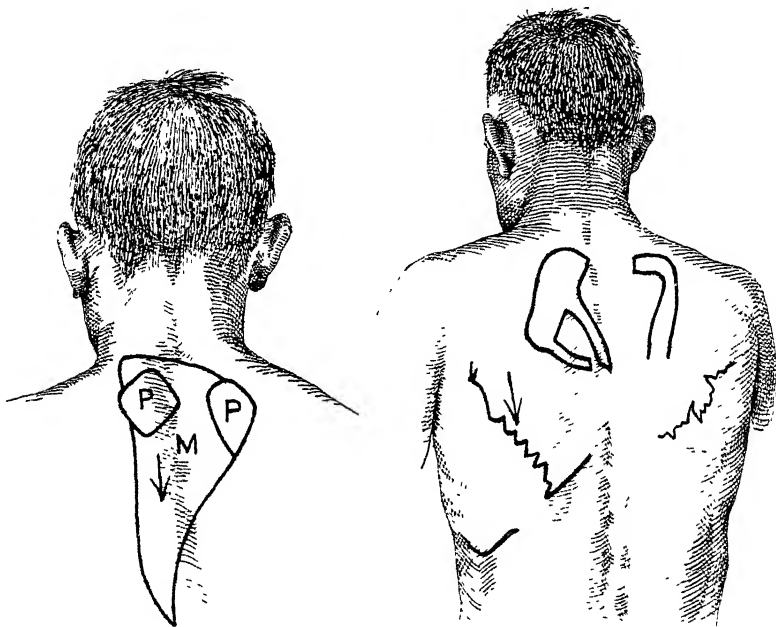


Fig. 49.—Coarctation of the aorta. (Case 1.) P, Areas of systolic, aneurysm-like pulsations (dorsal scapular arteries). Over larger zone, M, a systolic murmur was heard. (Figs. 49-51 by kind permission of the 'Archives of Internal Medicine'.)

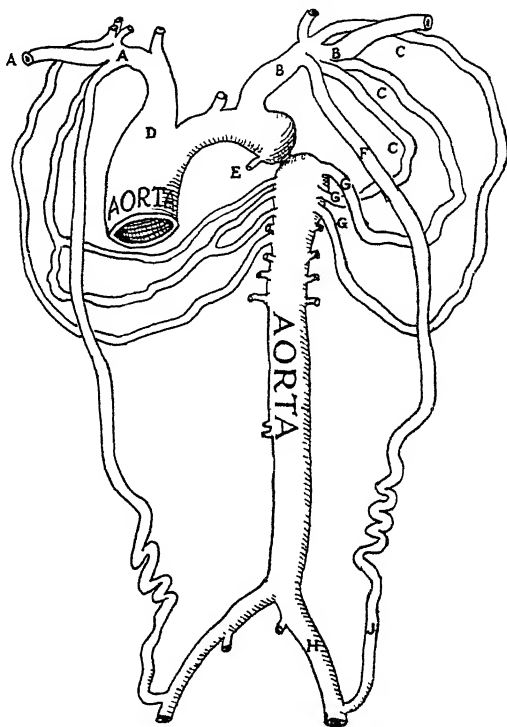
Fig. 50.—(Case 2.) Areas marked in interscapular region represent limits of forceful, aneurysm-like pulsation (the dorsal scapular arteries, probably anastomosing below with the intercostal arteries from the aorta and thus bridging the stenosis); the tortuous lines represent superficial arteries in which the flow was toward the aorta; these arteries filled readily from either direction, but a pulsation was visible in them only when the blood entered from the outer end.

than females, at any age after birth, and is compatible with life entailing hard labour. The most important symptoms are palpitation, dyspnoea, myocardial weakness, cramp in the legs, and intermittent claudication. There is greater pulsation in the upper extremities and a relatively higher blood-pressure than in the lower extremities. The arteries forming the collateral circulation to

the trunk and legs are large, especially the dorsal scapular arteries—which form aneurysm-like vessels in the interscapular region (probably the most important physical sign)—the internal mammary, and intercostal arteries (Figs. 49–51).

Fig. 51.—Coarctation of the aorta (not drawn to scale). (After Walshe, from Abbott and Dawson.)

A, Right subclavian artery; B, Left subclavian artery; C, Deep arteries of the neck; D, Innominate artery; E, Closed ductus arteriosus; F, Internal mammary artery; G, Aortic intercostal arteries; H, Internal iliac artery; J, Deep epigastric artery.



E. Weiss² records a unique form of septal defect, namely a *perforation of the lower part of the interventricular septum* midway between the apex and the mitral valve. The patient, a man of 79, had had no cardiac disease, and had suffered from nothing that might have caused a cardiac disturbance. During life his extremities were cyanosed, the veins of the neck engorged, and there was a marked systolic thrill and murmur over the ensiform cartilage.

REFERENCES.—¹*Arch. of Internal Med.* 1926, July, 69; ²*Ibid.* 1927, May, 705.

HEART FAILURE.

A. G. Gibson, M.D., F.R.C.P.

John Cowan,¹ in the George Alexander Gibson Memorial Lecture, approaches the subject of cardiac failure from four aspects: (1) Coronary artery disease; (2) Chronic valvular disease; (3) Alterations in rhythm; and (4) The recognition of cardiac failure.

1. Of cardiac failure due to *coronary artery disease* he gives the following subdivisions: (i) *Accidental group*: Cardiac infarction, occurring in the course of some other disease, e.g., pyæmia. (ii) *Cases with a sudden onset of symptoms*: (a) Immediately fatal; (b) Not immediately fatal; (c) With recovery. (iii) *Cases with an insidious onset of symptoms*: (a) Progressive; (b) Followed by an abrupt exacerbation of symptoms; (c) With recovery.

Short case reports are given illustrating these different types.

2. An analysis is given of the probable causes of failure in 49 cases of *chronic valvular disease* without endocarditis: 6 patients died from causes other than cardiac, 11 ascribed the onset of cardiac symptoms to some extrinsic cause—pulmonary catarrh, influenza, or physical exertion (5 patients), a variety of causes accounted for 22 cases, and in 8 no cause could be ascertained.

3. Under the effects of *changes of rhythm* he says: "But although there is no doubt that the development of a new rhythm leads to increased difficulty in the conduct of cardiac work, too much attention has been paid to this factor, which is after all in the majority of cases only one of the results of a lesion in the myocardium." If frequently repeated, paroxysmal tachycardia may lead to serious failure. He relates a case in which the paroxysm was associated with a failure of the pulse at the wrist. Though heart-block gives rise to some degree of cardiac insufficiency it is not necessarily associated with signs of failure, and cases have been recorded with heart-block lasting up to fifteen years. Heart-block is not necessarily associated with the Adams-Stokes syndrome, nor is the Adams-Stokes syndrome always accompanied by heart-block. In some of these latter, medullary lesions have been recorded. Fibrillation of the auricles with completely irregular pulse entails some interference with cardiac action and a lessening of reserve power, but there are many patients in whom this interference is minimal and whose lives appear in no way to be curtailed or hampered.

4. In the *recognition of the onset of cardiac failure*, Cowan lays stress on Mackenzie's teaching that the first symptoms are to be ascertained by a careful history. There is a gradual restriction in mental and physical output which shows itself in slight but clear indications that long customary exertions are gradually modified or avoided. Another point is to make the physical examination at the end rather than at the beginning of the day. Other indications are those given by *standardized effort tests* and the presence of a falling blood-pressure. The electrocardiograph is frequently of value in confirming the presence of abnormal action, suspected in other ways.

C. F. Coombs and C. E. K. Herapath² differentiate cardiac failure into three main types: (1) Auricular, as shown in auricular fibrillation; (2) Auriculo-ventricular, as in heart-block; and (3) Ventricular, as from myocardial degeneration. While this division takes no account of etiology, which may in itself be an indication for specific therapy, it is useful as giving some clear indications for the treatment of the failure itself. Auricular failure especially requires digitalis; ventricular failure requires rest and the relief in the fullest measure of all cardiovascular burdens, reduction of food intake to a minimum, bleeding in hyperpiesis, and treatment by iodides over long periods.

REFERENCES.—¹*Edin. Med. Jour.* 1296, Aug., 465, Sept., 533; ²*Clinical Jour.* 1926, Nov. 10, 529.

HEART, RUPTURE OF.

A. G. Gibson, M.D., F.R.C.P.

C. E. de la Chapelle¹ reports 14 cases of spontaneous cardiac rupture, in none of whom was syphilis a factor. Arteriosclerosis was the predominant factor in all, and a thrombus in one or other of the coronary arteries was found in 12. Eleven of the patients belonged to the labouring class.

J. S. Goodall and H. B. Weir² record 17 cases of rupture of the heart in 14 men and 3 women, of average age 69 in the men and 69.5 in the women. In 5 cases amongst the men only was there a history of previous cardiac disease, namely pains in the chest; 4 patients died after an effort; 12 without any obvious cause, 1 from emotion and effort; 1 patient lived for a fortnight after

the rupture. In all there was some disease of the coronary arteries, sclerosis or calcification or both, and in 5 a definite blockage or stenosis was found. One patient had a gummatous infiltration of the cardiac wall.

REFERENCES.—¹*Amer. Heart Jour.* (abstr. *Jour. Amer. Med. Assoc.* 1927, Aug. 7, 437); ²*Brit. Med. Jour.* 1927, i, 834.

HEART, SYPHILIS OF. (*See SYPHILIS, CARDIOVASCULAR.*)

HEART, VALVULAR DISEASE OF. *A. G. Gibson, M.D., F.R.C.P.*

E. P. Boas and M. H. Fineberg,¹ in an analysis of 135 cases of valvular disease, find that 29 per cent of the whole had hypertension. It occurs more frequently over 40 years of age. In mitral stenosis it is present in 50 per cent of those over that age. Aortic valvular disease, whether rheumatic, syphilitic, or arteriosclerotic, shows a less percentage (34 per cent). It is less in combined aortic and mitral disease than in either separately (21 per cent). They suggest that the granular kidneys frequently found in these patients and noted by many observers, especially in mitral stenosis, are the result of long-standing hypertension.

REFERENCE.—¹*Amer. Jour. Med. Sci.* 1926, Nov., 648.

HEART, WOUNDS OF. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

W. H. Cole⁴ records a recent case of suture of wounds of the heart. The patient was stabbed in the anterior thorax half an hour before admission to hospital. His symptoms were those of hæmorrhage and shock. The stab wound was about 1 cm. to the right of the right sternal border in the fourth interspace. Heart sounds were very faint, and there was much irregularity. There was no increase in the area of the cardiac dullness or change in pulmonary percussion or auscultation. The blade of the knife was broken and the end remained in the wound. During the ten or fifteen minutes' examination the patient's pulse became alarmingly weaker. He was taken to the operating-room, and a 3-in. incision was made under local anæsthesia along the right sternal border, just medial to the wound. The fourth and fifth costal cartilages were removed at the sternal junction. The broken blade of the knife was located, and the bone surrounding it cut away with a rongeur forceps. Removal of the blade allowed a moderate flow of blood to escape through a laceration in the pericardium. The lacerated wound was rapidly enlarged, and a huge amount of fresh and clotted blood escaped. After the relief of the pressure the heart-beats increased and the rhythm returned to normal. A ragged wound, measuring about 1 cm. by 2 cm., was found in the left ventricle, bleeding freely. Six or seven interrupted sutures of fine twenty-day catgut were introduced, and the pericardial sac was then closed. Ether anæsthesia became necessary before the termination of the operation. At the end of the second day the patient's dressing suddenly became saturated with serosanguineous fluid, with an improvement in his condition. The pericardial suture line had apparently ruptured. Pneumonia subsequently developed during the second week of his convalescence; subsequently an abscess formed in the anterior mediastinum. He was discharged about the end of the sixth week of his convalescence. Finally there was complete recovery.

Cole points out that such a vital factor as compression within the pericardium in traumatic heart surgery was recognized by Morgagni in 1761. Subsequently it was shown by Kuno that when the compression within the pericardium attained the height of the venous pressure, the heart ceased to function. As a precaution against compression of the heart, it is stated by Beck that an opening should always be left in the pericardium. The acceptable methods of

approach and exposure are all identical with or similar to the classical operations: median sternotomy, consisting of splitting the sternum; or intercostochondral thoracotomy, consisting of retraction of the sternum after section of three or four costo-cartilages. The necessity of immediate release of intrapericardial pressure in traumatic cases seems to favour section of the cartilages and retraction. If exposure is inadequate, subsequent to this approach, a portion of the sternum can quickly be removed. This was done in the author's case, allowing a perfect exposure of the ventricular portion of the heart. Subsequent observations on the patient have revealed no ill-effects from removal of the portion of his sternum. Neither can a pulsation be felt over the area, thus suggesting that the increased susceptibility to trauma is insignificant. The value of the preliminary application of a stay suture at the apex will depend largely upon the accessibility of the wound.

J. C. O'Day² says that there can be no surgical procedure freighted with more anxiety than that of dealing with a bleeding heart, and states that when bleeding from a wound fills the pericardial sac there will come a compression within, to which its motility must succumb. "He who hesitates is lost". These five words emphasize the expediency of his having to act quickly. Singly they may be likened unto five fingers pointing out the five steps of the operation in such an emergency: (1) A rapid and accurate chondroplastic thoracotomy; (2) A rapid and accurate pericardial decompression; (3) A deliberate, though gentle, delivery of the heart; (4) Suture of the wound; (5) Cleaning the field and establishing drainage. In one case when the pericardium was opened there was a gush of blood and clots so great that for the moment it seemed enough to be fatal, but it was the very opposite effect that was noted. With the heart's freedom restored the threatened cyanosis began to pale; the change was dramatic. When the heart was finally lifted from out the pool, the wound, bleeding on diastole, was securely closed by one mattress stitch. The patient made an uneventful recovery. O'Day gives a very vivid description of the operation. "Had I but known", he says, "that nothing, not even the bloodiest of fields, was to delay the vital step of the whole procedure, and that that step was the pericardial decompression". He wished he had realized that torsion must not be the means of bringing posterior heart wounds into view, but instead to carry the apex forward toward where it would describe a vertical line with the base. He emphasizes the importance of not suturing the slit in the pericardium; but, nevertheless, the drain should only pass down to, but not into, the pericardial sac. Wounds of the heart may be roughly divided into two classes: those that are immediately fatal and those that are not. The appearance of imminent death must never deter the hand. Pericardial decompression may change the whole picture. The 3rd, 4th, and 5th, and possibly the 6th rib may need division. Matas is quoted as saying: "Visible external hæmorrhage, hidden or concealed hæmorrhage, and, above all, signs of heart compression, call for immediate exploratory thoracotomy".

REFERENCES.—¹*Ann. of Surg.* 1927, May, 647; ²*Ibid.* 653.

HERNIA.

A Rendle Short, M.D., F.R.C.S.

There has been quite a revival of interest in the past year in the apparently threadbare subject of the operative cure of inguinal hernia, which will justify our considering it in some detail. Generally speaking, it is an established fact that the Bassini operation, properly performed and uncomplicated by post-operative hæmatoma or suppuration, will cure nearly every case in children, and also in adults if there is good muscle and not a large gap, but it cannot be relied upon when these complications are present.

Subcutaneous Injection.—Mayer,¹ taking a very gloomy view of the recurrence rate after operation for inguinal hernia, maintains that all cases can be cured by injection of an irritant fluid into the sac. The method is only suitable when the sac is free of gut and omentum, and from 16 to 30 injections will be needed. The patient must wear a truss night and day during the treatment, which lasts at least three months. The fluid used is:—

R	Zinc. Sulphat.	℥ j	|	Aq. Cinnamom.	fl. ℥ j
	Phenol. Cryst.	℥ vj	|	Fluid. Ext. Pin. Canad.	fl. ℥ v
	Glycerin.	℥ iv	|	Aq.	fl. ℥ ij

Stand a week, filter, and boil.

He maintains that 98 per cent of those who follow through the treatment are cured. We think most patients would prefer an operation!

Operations for Inguinal Hernia.—G. Keynes,³ who is medical officer to the London Truss Society, states that 350 cases have been seen there during the past ten years with relapse after operation, 275 after inguinal, and 90 after femoral.

One of the greatest annoyances after the Bassini operation, and one also that makes for suppuration and so for relapse, is the development of a *hematoma*, and for some reason this is far more prevalent after incisions in the groin than elsewhere in the body, probably because of movements shifting the ligatures. We advise three devices to counteract this tendency: (1) Stitch the larger vessels; do not be content with mere tying; (2) Use a rubber dam drain for twenty-four hours; (3) Fix the bottom of the scrotum up on the abdominal wall by a stitch for twenty-four hours. Should any bleeding occur, it cannot then fill the scrotum.

Cowell³ points out that several workers have experimented lately on the results of *union between fascia and muscle*. Gallie and Le Mesurier in 1921, and Seelig and Chouke in 1923, found that they will not unite after suturing. Koontz in 1926 obtained a more favourable result by cleaning or scarifying the muscle, but Seelig⁴ in 1927 has repeated his work and maintains that muscle is useless for joining to fascia. This, of course, cuts at the root of the Bassini operation, unless transversalis fascia can be found to sew with the internal oblique to Poupart's ligament behind the cord. Cowell therefore uses a new method, which he has tried in 125 cases, only one of which has recurred. (The recurrence rate for the Bassini operation in men is about 5 per cent in oblique hernia and 16 per cent in direct hernia.) The principle is, after tying off the sac in the ordinary way and closing the internal abdominal ring, to prepare a pedicled flap from the inner portion of the aponeurosis of the external oblique, and a smaller one, a 'slip', from the outer portion. The flap is about $\frac{1}{2}$ in. wide, and is long enough to reach from the inner pillar of the external ring, which is its pedicle, up to the internal ring. The 'slip' is also attached distally, but is smaller. The flap is placed under the cord, to fill the gap between the internal oblique and Poupart's ligament, and is stitched with a living suture to Poupart by means of the 'slip', which has a loop of thread attached to it to make it easily workable. The upper border of the flap is sewn to the transversalis fascia and the conjoint tendon. The incision in the external oblique aponeurosis is then repaired in the usual way.

Another method has been recently introduced, or revived, by Gersch,⁵ of Touapse in the Caucasus, and by Farr⁶ in New York. The essence of it is that the outer border of the rectus sheath is mobilized by making a vertical incision in the anterior rectus sheath (Gersch also making one in the posterior sheath), so that it may be brought down easily and sewn to Poupart's ligament.

Keynes advises Gallie's method of using a 'darn' of living suture, derived from a strip of the patient's fascia lata.

One or other of these three methods will no doubt be preferable to Bassini's technique in the more difficult cases, but the well-proved success of that operation in the ordinary type of case will make us hesitate to give it up in spite of the theoretical objections.

Femoral Hernia.—Keynes points out how common recurrence is after the 'low' operation for femoral hernia, or when it has been strangulated. The standard operation to-day is the inguinal approach, above Poupart's ligament, and relapses are very few. In the worst type of case it may fail, and Keynes therefore turns down a pedicled flap cut from the internal oblique layer of the rectus sheath, and sews it to the ligament of Astley Cooper or to the peritoneum of the pubes, to bridge the gap from Gimbernat's ligament to the femoral vessels. This method is available, under a local anæsthetic, in cases of strangulated femoral hernia, and avoids the probability of recurrence of the hernia.

Strangulated Hernia.—Ogilvie,⁷ giving a general account of the treatment of this condition, mentions some points that are not always known or practised. He stresses the advantage of gas-oxygen or a local anæsthetic. It is seldom necessary to incise the neck of the sac with a bistoury; it is usually sufficient, and safer, to snick through the layers from without inwards. In femoral cases it is better to divide Poupart's ligament and open the inguinal canal rather than cut Gimbernat's ligament blindly. Much more room is thus obtained. If there is trouble with ileus after the operation, half a pint of liquid paraffin introduced down the stomach tube after gastric lavage is valuable; it has a remarkable power of finding its way, and making a way, along the bowel, and cannot do any harm.

According to Wolff,⁸ the practice at Dresden in cases of gangrenous hernia that would ordinarily be resected is to make a proximal side-to-side anastomosis, and then invaginate the loop of dead bowel, even if it be 5 cm. long, into the loop next above it, making a sort of retrograde intussusception, which is passed as a slough per anum. The invagination is secured by a ring of Lembert sutures.

Hernia Surgery and the Appendix.—F. Hesse,⁹ of Dresden, and Mermingas,¹⁰ of Athens, both advise that the appendix should be removed at the same time and through the same incision, when a right-sided hernia is operated on. They declare that in the majority of cases it will be found diseased!

Internal Hernia and X Rays.—Case and Upson¹¹ comment on the frequency with which they have been able to demonstrate, quite unexpectedly at times, an internal or diaphragmatic hernia by the routine X-ray examination.

REFERENCES.—¹*Med. Jour. and Record*, 1927, April-May, 528, 596; ²*Brit. Med. Jour.* 1927, 1, 173; ³*Lancet*, 1927, 1, 478; ⁴*Jour. Amer. Med. Assoc.* 1927, Feb., 529; ⁵*Zentrabl. f. Chir.* 1926, Sept., 2324; ⁶*Surg. Gynecol. and Obst.* 1927, Feb., 261; ⁷*Lancet*, 1926, ii, 1126; ⁸*Zentrabl. f. Chir.* 1926, Sept., 2260; ⁹*Ibid.* 1927, May, 1282; ¹⁰*Ibid.* 1926, Aug., 2211; ¹¹*Jour. Amer. Med. Assoc.* 1926, Sept., 891.

HERNIA, INGUINAL, IN CHILDREN. *John Fraser, Ch.M., F.R.C.S.Ed.*

The operation for inguinal hernia in young children is discussed by A. Krecke,¹ who expresses surprise that it is so infrequently practised by many surgeons. This does not represent the experience in this country; we would say that it is the exception to find the operation discouraged unless there is some definite contra-indication. Krecke's allusion to the safety of the operation will be fully endorsed by all pediatric surgeons in this country. There is nothing original in the article, unless it be certain minor points of detail in respect of technique. Tannic alcohol (7.5 per cent) is employed as the skin preparation. The account of the operation would have been improved if more precise directions had been given for the identification and exposure of the sac. This is

the part of the operation in which difficulties may arise, and complications are so easily avoidable if the surgeon appreciates the importance of orienting the cord so as to bring the venous plexuses into an antero-lateral plane. It is stated that strangulated inguinal hernia is common in small infants. One would say, on the contrary, that it is a peculiarly rare event.

REFERENCE.—¹*Munch. med. Woch.* 1927, June 24, 1060.

HICCUP.

Ivor J. Davies, M.D.

C. F. T. East¹ contributes an article on the treatment of persistent hiccup. As the author says, nothing is more exhausting to the patient than this affection, and it may be a serious post-operative complication. Most commonly the centre of irritation causing the spasm is below the diaphragm. A careful consideration of the source of irritation is an absolute essential to successful treatment. Simple measures of treatment should first be tried, as holding the breath, the induction of sneezing, drinking from the wrong side of a glass, pressure on the epigastrium, which may be self-imposed by drawing up the knees and holding the thighs firmly against the abdomen for several minutes. Measures of counter-irritation should next be tried, as, e.g., a Blister raised over the third and fourth cervical nerves at the root of the neck just above the clavicle, or a Mustard Plaster applied to the epigastrium. Firm Strapping of the lower part of the chest in expiration may be effective in cases of basal pleurisy. In gastric cases, carminatives are useful, and each should be tried in turn when necessary, e.g. 5 to 10 min. of the Tincture of Capsicum in a little water, 5 min. of the Spirit of Camphor in a little milk or on a lump of sugar, or 5 min. of Turpentine in a capsule, or 1 min. of Oil of Cajuput in a wineglassful of hot water and sipped as hot as it can be borne. In toxæmic states, as in uræmia, treatment of the cause will lessen the tendency to hiccup; but it may persist obstinately, and various empirical measures must be tried, as, e.g., Atropine $\frac{1}{100}$ gr. hypodermically, or Tincture of Belladonna 10 min. four-hourly. The various sedatives, and even hyoscine or morphia, may have to be tried.

REFERENCE.—¹*Lancet*, 1926, ii, 140.

HIP-JOINT, SURGERY OF. (*See also* PARALYSIS, TENDON TRANSPLANTATION FOR; TUBERCULOSIS OF THE BONES AND JOINTS.)

E. W. Hey Groves, M.S., F.R.C.S.

Arthroplasty for Ankylosis of the Hip-joint.—It is now many years since Murphy published his method of arthroplasty for ankylosed hips, and yet at the present day all those who are familiar with the subject admit that it is one of very great difficulty. Murphy's operation, the main outlines of which have been followed by subsequent workers, consists in a lateral exposure of the joint, the raising of the great trochanter, refashioning the joint surfaces, lining the acetabulum by means of a pre-formed pedicle flap. It is quite certain that this method would have been widely adopted if it had given reasonably good results; but, on the other hand, it has given a considerable mortality, with a comparatively small proportion of really good functional results. The cause of failure in the Murphy operation is probably to be found in the pedicled flap with which the acetabulum was lined. The actual dissection of this flap necessitates the creation of a large bleeding surface, and this in its turn involves hæmorrhage, dangers of secondary sepsis, and the ultimate formation of many adhesions. All subsequent workers have endeavoured to find some better structure with which to line the new joint. The majority have employed a graft from a free transplant of the fascia lata. Willis Campbell¹ has described a technique by which the new membrane is made to

give a double lining to the joint, one surface covering the acetabulum and the other the head of the femur. (*Fig. 52*). The exposure of the joint is done by Murphy's method, the head of the femur and the socket of the joint both being rendered smooth by suitable reamers. A large sheet of fascia lata is then cut out, 8 in. by 4 in., and one end of this is sewn to the edge of the acetabulum whilst the other is wrapped round the neck of the femur. Campbell gives an account of 48 cases, in which the results are good in more than 50 per cent and fairly good in a considerably larger proportion.

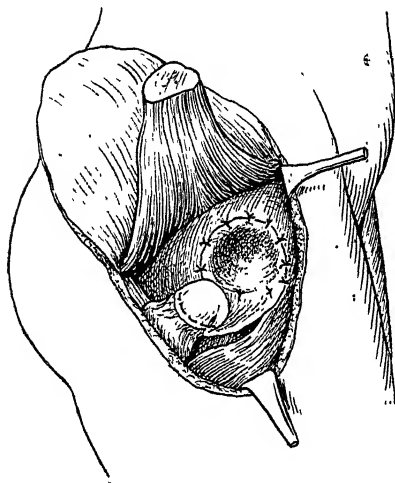


Fig. 52.—Campbell's arthroplasty for ankylosis of hip-joint. Investment of acetabulum and head of femur with one continuous membrane of transplanted fascia lata, making a double fold between raw bony surfaces. (*Re-drawn from 'Surgery, Gynecology and Obstetrics'.*)

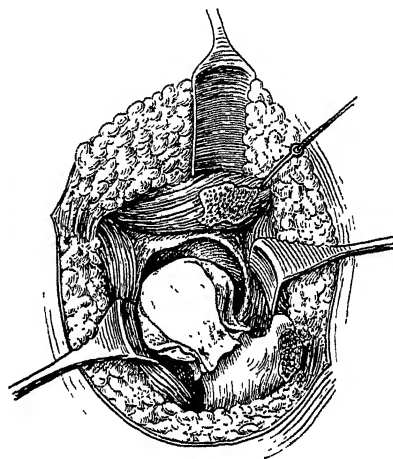


Fig. 53.—Arthroplasty of the hip, showing the new acetabulum of the hip. The dislocated head is seen surrounded by membrane. (*Re-drawn from the 'Journal of Bone and Joint Surgery'.*)

W. S. Baer,² who has been working on this subject for more than fifteen years, presents an account of no less than 100 cases of arthroplasty of the hip for various conditions of ankylosis. He is a strong advocate for the use of previously prepared animal membrane. This is taken from a pig's bladder and sterilized by immersion in chromic acid so that it will resist absorption for about forty to fifty days. After the head of the bone has been exposed and remodelled it is wrapped round with an ample covering of the membrane, which is then closely pleated round the neck of the femur (*Fig. 53*). At the conclusion of the operation the hip is encased in a firm plaster cast, which is, however, only left in place for forty-eight hours. After this the cast is removed and the leg is slung in a Thomas splint with a traction of 20 lb. Of the 100 cases reported by Baer, the following list gives the nature of the causative condition and the results of the operation:—

	Cases	Good results
Gonorrhoeal arthritis ..	19	95 per cent
Tuberculous arthritis ..	27	74 "
Septic infection ..	43	82 "
Fracture	2	100 "
Arthritis deformans ..	9	55 "

Taking all the cases together, Baer claims to get 82 per cent of good results from his method of operating. There can be no doubt that this is the best series of cases ever yet published. His criteria of a good result are that the joint should have at least 25° of voluntary flexion, and that it should be stable and painless. He is in agreement with other workers in saying that gonorrhœal cases are the most favourable for operation, and that tuberculous cases must be selected with great care and only operated upon many years after the disease has become quiescent.

Hey Groves³ considers that the poor results in hip arthroplasty are due to the re-formation of adhesions between the joint surfaces. It seems only natural to suppose that, when a piece of living membrane is interposed between two raw bone surfaces, this membrane should become adherent to both, with the ultimate result of fibrous ankylosis. He therefore attempts to utilize the existing synovial cavity of the joint and to interpose the lining of this cavity

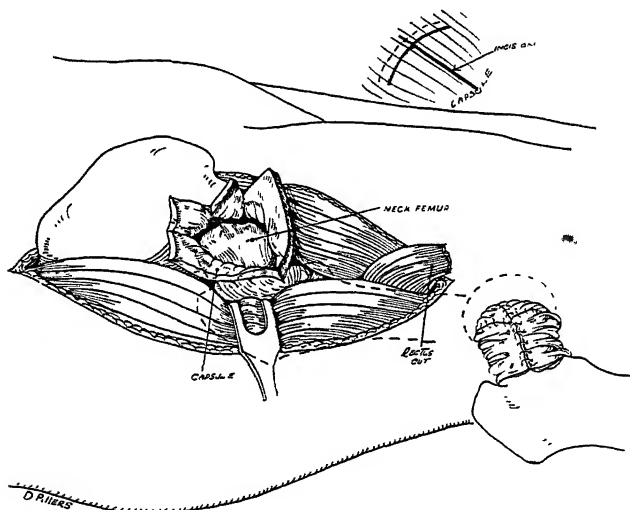


Fig. 54.—Arthroplasty of hip, showing exposure of the neck of the femur by division of the capsule. Inset above, line of capsule division; below, the neck of the femur enveloped in capsule. (By kind permission of the 'British Journal of Surgery'.)

between the joint surfaces. This idea is carried out by investing the remodelled head and neck of the femur with the capsule of the joint with its original synovial lining. In opening the hip-joint the capsule is cut by a T-shaped incision, the cross-member of which divides the origin of the capsule from the acetabulum. After the head has been remodelled, the remainder of the capsule is cut away from the back of the acetabulum, and the shortened head of the femur is then completely enveloped in its own capsule, which is pushed into the enlarged acetabulum. (Fig. 54.)

Fusion for Tuberculous Hips.—As the result of general experience, open operation upon tuberculous hip-joints has been almost completely abandoned. It is recognized that both in children and adults conservative treatment gives very much better results than anything that can be obtained by attempts at radical operation. But although a fair proportion of tuberculous hips make a good functional recovery under conservative treatment, yet it must be admitted

that a considerable number are left with a weak and painful joint, or one which is associated with a discharging sinus. In such a case the best hope for functional recovery is to bring about a fixation of the joint which will give a painless weight-bearing limb. The difficulty in carrying out this idea consists in the fact that any open operation upon the tuberculous tissues will probably light up fresh infection. Russell Hibbs⁴ has met this difficulty by devising a fusion operation which is almost extra-articular. A longitudinal lateral incision is made from the crest of the ilium down to the shaft of the femur below the great trochanter. A piece of bone including the whole of the great trochanter and the upper part of the shaft of the femur is separated without destroying

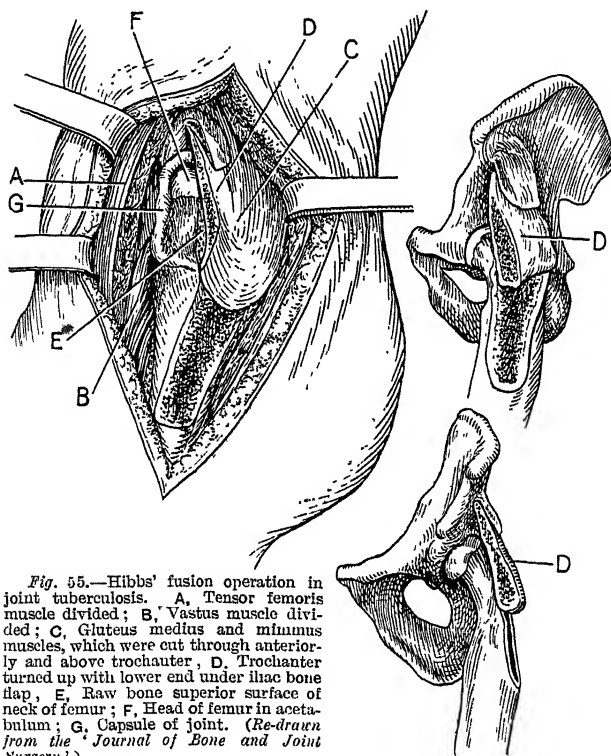


Fig. 55.—Hibbs' fusion operation in joint tuberculosis. A, Tensor femoris muscle divided; B, Vastus muscle divided; C, Gluteus medius and minimus muscles, which were cut through anteriorly and above trochanter, D, Trochanter turned up with lower end under iliac bone flap, E, Raw bone superior surface of neck of femur; F, Head of femur in acetabulum; G, Capsule of joint. (Re-drawn from the *Journal of Bone and Joint Surgery*.)

its connection with the overlying soft parts. A flap of bone is also turned up from the outer surface of the ilium. The trochanter mass of bone is then slid upwards underneath the iliac flap and firmly wedged in its new position. By this means a strut of new bone is formed which connects the pelvis above with the femur below, and which, when ossified, will cause fixation of the joint. (Fig. 55.) Hibbs gives an account of 20 cases in which this operation has been performed. These have been treated for an average of six years by conservative means. In 12 cases the results were good and the wound healed by first intention. In 6 the healing of the wound was delayed for a few months owing to the formation of sinuses. One had a severe infection which prevented

fusion, and one died of miliary tuberculosis nine months after the operation. It is very unlikely that this operation will be widely practised. It is open to the very serious objection that, although it is mainly extra-articular, yet it does open up the capsule of the hip-joint, and moreover it makes use of bone tissue which may be actually infected by tubercle, or which will be atrophic from its proximity to old-standing tuberculous disease.

Treatment of Congenital Dislocation of the Hip.—Whilst there is general agreement as to the excellence of the result of the manipulative treatment of congenital hip dislocation, there is still much difference of opinion as to the best method of open operation. It is, however, notable that many more surgeons are now prepared to admit the need for open operation in a large number of cases. When the interior of one of these joints is inspected, it is very difficult to understand how any force or artifice of manipulation can bring about stable reduction; for in the first place the acetabulum is so shallow that it will not retain the head, and in the second place the thickened capsule is so contracted between the head of the bone and the socket that it is quite impossible to push the femoral head through the narrow opening of the capsule. It is, of course, possible that forcible and repeated manipulations may tear the capsule away from the rim of the acetabulum; but it is very unlikely that any stable reduction of the joint can be made in this manner. B. P. Farrell, H. L. von Lackum, and Alan de F. Smith,⁵ in reporting the results of treatment of 310 cases of congenital dislocation of the hip, conclude that success by closed reduction can only be expected in about 50 per cent, and they make a very strong plea that a much larger proportion of cases should be submitted to open operation. H. P. H. Galloway,⁶ who was one of the first workers to advocate open operative treatment, now gives us the results of a considerable series of cases. In his last 38 cases Galloway claims to have cured 15, and to have obtained a good result but short of complete cure in 18, and a doubtful result in 5. In no case was there definite failure. The attitude this writer takes about the subject differs from that of others in that he is more inclined to use the open method even in children of three years of age. Most observers have had the experience that, if the case can be obtained early enough to succeed in bloodless reduction, a more perfect functional result will be assured than when an open operation has been performed. The operation advocated by Galloway, and that performed by the majority of surgeons, such as Lance and Ombrédanne,⁷ consists in making a new rim to the acetabulum by turning down a bone flap.

Hey Groves,³ in reviewing this subject, points out that there are two generally accepted methods of operation for congenital dislocation of the hip. In both of these the capsule is widely opened and the head of the bone pushed into the acetabulum. If reposition is not stable, then one of two methods has been employed to make it so: either the shallow acetabulum is gouged out so as to form a socket deep enough to hold the femoral head, or else the upper margin of the acetabulum is built up by some kind of plastic surgery. The most simple and efficient method of making a new rim to the acetabulum is by turning down a flap of bone from the ilium and holding this in position by a wedge, the latter being most conveniently prepared from ivory or beef-bone. Both of these methods of operation are, however, liable to a particular element of failure. If the acetabulum is gouged out, the result will be a strong and stable hip-joint but one in which very limited movement is possible even if ankylosis does not take place. On the other hand, if the rim of the acetabulum is built up whilst the cartilage in the hip socket is left intact, a freely movable hip-joint will result, but considerable lameness persists. In order to attain stability and mobility at the same time this author has devised a new method.

The hip-joint is exposed by the anterior Smith-Petersen incision, and the capsule of the joint fully exposed but not opened; the attachment of the capsule to the margin of the acetabulum is separated, and the area of the hip socket laid bare. The socket is then freely enlarged until it presents a cup large and deep enough to take the head of the bone enveloped in the capsule. The neck of the capsule is sewn up by a stout ligature of kangaroo

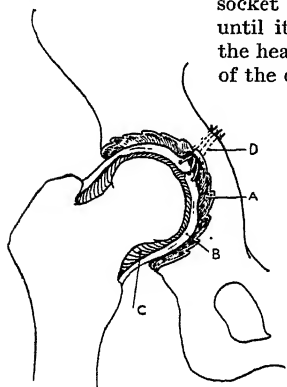


Fig. 56.—Operation for congenital dislocation of hip. Diagram showing deepened acetabulum with the whole capsule detached from the rim of the socket and used to anchor the head in its new bed. A, New acetabulum; B, Capsule; C, Synovial cavity; D, Sutures fixing capsule round the head and brought through the floor of the acetabulum. (Figs 56-58 re-drawn from the 'British Journal of Surgery'.)

Fig. 57.—Drawing of operation for transplanting capsule inside the acetabulum. A, New acetabulum; B, Out edges of capsule being sewn together by sutures, which are left long and then taken through a hole in the floor of the acetabulum.

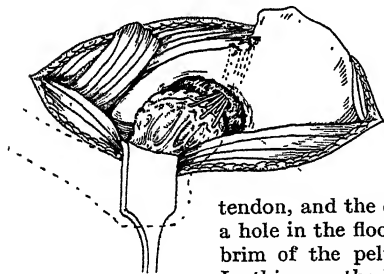
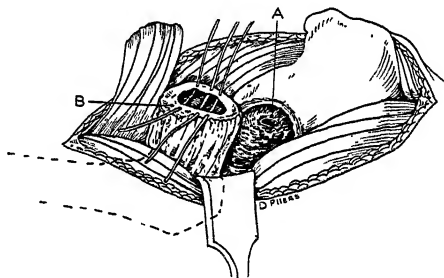


Fig. 58.—Shows sutures drawing the capsule into its new position lining the acetabulum.

tendon, and the ends of this ligature are brought through a hole in the floor of the acetabulum and then over the brim of the pelvis, where the ends are firmly secured. In this way the head of the bone is tied into position to the floor of the acetabulum by means of its own capsule, a deep socket is made which ensures stability of reduction, and the smooth lining of the original membrane is preserved. (Figs. 56-58.)

REFERENCES.—¹*Jour. Bone and Joint Surg.* 1927, April, 331; ²*Ibid.* 1926, Oct., 769; ³*Brit. Jour. Surg.* 1927, xiv, Jan., 486; ⁴*Jour. Bone and Joint Surg.* 1926, July, 522; ⁵*Ibid.* 551; ⁶*Ibid.* 539; ⁷*Bull. et Mém. Soc. Nat. de Chir.* 1927, 11.

HIRSCHSPRUNG'S DISEASE.

John Fraser, Ch.M., F.R.C.S.Ed.

OPERATIVE TREATMENT.—The difficulties in the treatment of Hirschsprung's disease are so fully appreciated that any suggestion leading to improved results will be welcome. An interesting and stimulating record is contributed by R. B. Wade and Norman D. Royle.¹ Royle and Hunter's work on the sympathetic innervation of muscle is now familiar to all those who are interested in the

subject, and in view of the recent work of Hirst and others, the connection of megalocolon and other associated conditions with a sympathetic disturbance was a reasonable conclusion. The operation recorded in this article is the logical sequel to the previous experimental and clinical work.

By way of contrast the histories of two cases are detailed. The first (a boy eight years old), after experiencing various vicissitudes, was operated on for Hirschsprung's disease by the method of colectomy. Six months later constipation was still present, and a barium enema revealed a gross dilatation of the lower end of the ileum at the point of its new attachment to the rectum—in fact, the error had recurred. The second case (a boy 10 years old) suffered from a well-established degree of the disorder. After preliminary evacuative treatment by means of enemata, the operation of lumbar sympathetic ramisection was performed on the left side. The white ramus to the first lumbar ganglion and the medial branches from the first, second, third, and fourth ganglia were severed, and the trunk cut across below the fourth ganglion. Fourteen days later the abdomen was flat, and the bowels were being opened without aid. "Five months after the operation the child's general health was good, the bowels opened each day without aid, the abdomen was flat, and no peristalsis was elicited." The result is a very striking one. Not only would it seem to confirm the reasoned conclusion of experimental evidence and the hypothesis derived therefrom, but it seems to offer possibilities of treatment and relief in this so intractable disorder. The possibility of relapse is, of course, the fear that remains, and we shall await with the closest interest the further history of Wade's remarkable success.

REFERENCE.—*Med. Jour. of Australia*, 1927, Jan., 131.

HODGKIN'S DISEASE.

Ivor J. Davies, M.D.

G. P. Muller and R. S. Boles¹ write on the *abdominal manifestations* of Hodgkin's disease, with a report of three cases. Primary involvement of the abdominal viscera in Hodgkin's disease is exceedingly rare. The first case of the disease described by Hodgkin² himself appears to have been an example of the internal form, in which ascites was present and the abdominal glands were much enlarged. The present contributors state that little is to be gained from a consideration of the symptoms in the abdominal type of Hodgkin's disease, since they are variable and may simulate a number of acute and chronic conditions. Symptoms referable to the gastro-intestinal tract are usually present when the abdominal viscera are affected. Pruritus, diarrhoea, and a recurrent type of fever are always suggestive; jaundice, ascites, and adenopathy may be present. Peptic ulcer, appendicitis, typhoid fever, and tuberculous peritonitis are the most important conditions simulated by the abdominal type of Hodgkin's disease. The diagnosis as a rule is exceedingly difficult, yet not impossible if the condition be borne in mind in any case of obscure fever. An accessible enlarged gland should be removed and examined.

The retroperitoneal glands, especially the coeliac group, are most frequently affected in this type of the disease. The ordinary method of investigation of a case of obscure pyrexia gives negative results, and where no gland or spleen can be felt, the diagnosis can only be tentative, and arrived at by a process of exclusion. The reviewer, in a few suspected cases, has made a provisional diagnosis through the finding of a firm resistance in the epigastrium suggestive of some retroperitoneal condition, and in another through careful palpation disclosing enlargement of the external iliac group of glands. The present observers maintain that, in atypical forms of Hodgkin's disease, confirmatory evidence is usually supplied by frequent blood examination, the blood picture

being fairly characteristic. Most authorities deny the existence of a characteristic blood picture. In treatment the best results in the way of 'temporary amelioration' have been obtained by Röntgenotherapy, both general and local. Such therapy should be directed primarily to the abdominal deposits.

C. F. Burnam³ makes a contribution on Hodgkin's disease with special reference to its treatment by Irradiation. The following conclusions, based on a study of 173 cases, are drawn: "While Hodgkin's disease is a very fatal malady, its treatment, from the standpoints of both palliation and cure, is hopeful. In this connection radium stands in the first place, although it is possible that similar results may be obtained by Röntgen-ray irradiation". Twenty-eight patients were classed as clinically cured (two died in the ninth year from apoplexy), and had been free from any sign of the disease for periods varying from one to over ten years.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1927, Jan. 29, 301; ²Hodgkin, quoted by Samuel Wilks, *Guy's Hosp. Rep.* 1865, ii, 57; ³*Jour. Amer. Med. Assoc.* 1926, Oct. 30, 1445.

HYPERPIESIA.

A. G. Gibson, M.D., F.R.C.P.

C. L. Andrews¹ endeavours to classify a number of varieties of hyperpiesis as follows: (1) Hypertension without apparent cause, diastolic pressure below 100, occurring in women about the menopause and with a tendency to return to normal. (2) Hypertension with a sustained systolic pressure and a diastolic pressure of 100 or below, both pressures falling with rest and eliminative treatment. (3) Systolic pressure falling with rest, diastolic of 110 or more not affected. (4) Similar to (3), but with a rhythmic variation of pressure which disappears with rest and reappears on exertion. (5) The hypertension of highly neurotic persons, the diastolic below 100, varying little with any form of treatment. The author believes that many of these patients need rest and cardiac support, and that there is no type of case next to auricular fibrillation that does so well on Digitals.

Pal, 22 years ago, summarized our knowledge of vascular crises such as occur in eclampsia, lead poisoning, angina pectoris, chronic interstitial nephritis, and hypertension. An interesting account is given by H. Vaquez and E. Donzelot² of certain aspects of these crises in hypertension in a man of 37 with a good family history and no evidence of syphilis, alcohol, or other constitutional disease. A crisis occurred suddenly, following on effort or emotion or without obvious cause; the patient felt discomfort in the fingers or toes, followed by pains and cramps in the calves and thighs; then, in rapid succession, abdominal pains in the form of violent colic, thoracic pain, and cervical pain of the anginal type, and at last a terrible headache. There were neither nausea, vomiting, nor convulsions, and consciousness remained unchanged. The crises lasted several minutes, and were of such violence that the patient was in continual dread. The pulse-rate in one attack observed by the authors rose from 70 to 100, and the blood-pressure, previously 140 to 80, rose to 300 to 170. The acme of the crisis occurred in the third minute, and towards the seventh the pressure was again normal. In one of the attacks he had a violent pain in the right eye, the vision of which remained permanently impaired, leaving some hæmorrhages in the retina. Two other symptoms occurred, but not constantly: salivation and a transitory albuminuria. The effect of the more violent attacks was to leave the patient very pale and collapsed. The authors refer also to two cases with milder attacks observed by them in a man of 36 and a woman of 40. A case reported by Marcel Labbé in 1924 was found to have normal kidneys except for minute hæmorrhages; but attached to the left kidney was a supra-renal tumour of the size of a Tangerine orange. Regarding the mode of origin of these attacks, the rise of pressure may be from stimulation of the medulla;

from stimulation of the peripheral end of a vasoconstrictor nerve supplying a large area; and by reflex stimulation, especially along the afferent vagal paths such as occurs experimentally by stimulation of the central end of the vagus. The authors refer to two cases in which crises arising in this last manner were observed—one of carcinoma of the œsophagus and another with a mediastinal tumour. A further possibility is by direct stimulation of the muscular walls of the arteries. They also allude to the increased arterial tension resulting from injection of an extract of the anterior lobe of the hypophysis, and of tyramine, a decomposition body of tyrosin.

W. C. Alvarez, R. L. McCallor, and A. Zimmermann,³ in a careful investigation of the blood-pressure in 410 men and 585 women, find that neither constipation nor diarrhoea has any effect in men; in women all variations from normal action of the bowels have a slight lowering effect.

J. E. Paullin⁴ investigates the ultimate results in 76 cases of essential hypertension, and finds a persistent elevation of the maximum and sometimes the minimum pressure without ascertainable cause. The complications found in the 22 fatal cases were: precordial pain or distress (11 cases), dyspnoea on exertion (11 cases), angina (9 cases), arterial eye changes (7 cases), cerebral hæmorrhage (7 cases). Of less frequency are asthenia, extra-systoles, attacks of dizziness, renal impairment, and aortic insufficiency. Of the cause of death in these 22 cases, 6 were from cerebral hæmorrhage, 7 were from myocardial insufficiency; in 4 cases death was from some wholly different cause. The mortality was 48.7 per cent for men and only 9.2 per cent for women. The results show that on the blood-pressure alone no prognosis can be given as to the organ likely to be first affected or as to the cause of death.

W. Weitz and A. Sieben⁵ investigated 100 cases of hypertension which they divide into five groups: (1) Those who died in consequence of hypertension; (2) Those who died from causes wholly different from hypertension; (3) Those in whom the blood-pressure has a tendency to rise; (4) Those in whom the blood-pressure remains stationary; and (5) Those in whom it tends to fall. Of Group 1 the general conclusion is that in the youngest and oldest sections death occurs from cardiac failure; in middle life it occurs from cerebral hæmorrhage. Group 3 comprised 17 cases; 7 of these showed a diminished capacity for work. The pressure did not rise gradually, but showed tendencies to remissions. Marked diminution in pressure is frequently caused by cardiac insufficiency. In 32 cases (Group 4) the pressure remained more or less the same, and in none of these had the physical capacity deteriorated. In Group 5 the blood-pressure showed a tendency to fall; there were 19 cases (5 men and 14 women). The preponderance of women is due to the fact that the pressure tends to rise during the menopause and may fall to normal afterwards. No patient was included in this group who might have suffered from cardiac insufficiency. One possible cause of the lowering in pressure is a general diminution in circulating energy from advancing years. It is important to attempt to ascertain the length of the latent period, i.e., that period of hyperpiesis in which symptoms have not been present, for the manifest period tends to increase with the latent. In many patients with hyperpiesis there is an increased capacity for bodily exertion; in others again the bodily condition remains good. A favourable outlook may be given if the hypertension is latent and if the physical energy remains unimpaired. Hyperpiesis does not carry necessarily a grave prognosis, and its favourable aspects are too seldom noticed by the physician. In the latent stages there is no necessity to make any comment on it to the patient if his manner of life is good. When symptoms show themselves, the position should be explained, and the necessary alteration in the patient's life, if any is required, clearly given.

Certain authors in recent years have asserted that hypertension is always associated with structural, mainly arteriolar, change in the kidneys, and that those cases which show no evidence whatever during life of renal changes, nevertheless have these changes in a very early stage. It is also true that cases which have shown no rise of pressure during life nevertheless show abundant changes of the arteriolar type in the kidneys. Another explanation of these anomalous apparently non-renal cases of hypertension is that they depend on arteriolar changes in the medulla oblongata and a consequent diminution of blood-supply. Leonard Hill in 1896 showed that ligation of one or more of the arteries supplying the brain in a dog caused a rise in systemic pressure, which fell as soon as a proper collateral circulation had been established. He also showed that cerebral compression caused a rise in the systemic blood-pressure proportional to the amount of pressure exerted within the cranial cavity. This was restated in 1901 by Cushing as follows: "An increase of intracranial tension occasions a rise of blood-pressure which tends to find a level slightly above that of the pressure exerted against the medulla". These views from the experimental standpoint were finally and fully confirmed in 1925 by Starling and Anrep, who determined that a fall or rise in the arterial pressure in the brain was accompanied by a rise or fall respectively in the systemic blood-pressure, and that the mechanism was nervous through the spinal cord.

J. Bordley and B. M. Baker, junr.,⁶ have made an investigation into a series of 24 cases whose arterial tension had been recorded during life. Their results show that though a large number of the cases had renal changes of the chronic type, some with and some without hyperpiesis, some showed no, or but slight, renal changes with well-marked hyperpiesis, but that all of these had sclerosis of the medullary vessels. Of the cases with low blood-pressure, none showed medullary sclerosis; the kidney lesion varied from nothing to severe chronic nephritis.

Sir Humphry Rolleston,⁷ in an interesting review of the subject, points out that certain bodily conformation accompanies hyperpiesis, and that such conformation is different for men and for women (Draper). Of physical signs other than the raised blood-pressure, he lays stress on hæmorrhages from a mucous membrane such as epistaxis, gastro-intestinal or pulmonary, or from the retinal vessels where they depend on some further factor than the high tension; this factor consists in vascular local lesions, and is true for the cerebrum as well as the retina. The blood may show polycythæmia, the urine is secreted in increased amount, and there is nocturnal micturition. The metabolic rate is not raised unless there is dyspnœa. There is no clear relation between hyperpiesis and hyperglycæmia. Rolleston follows Allbutt in looking with considerable suspicion on the view that transient processes are due to arterial spasm. They are frequently the result of small hæmorrhages. When cardiac dilatation ensues, or shortness of breath on exertion is marked, the patient has entered on the late stage. The most important symptoms are headache, vertigo, neurasthenia, cardiac pain, and abdominal symptoms such as flatulence, periodic attacks of vomiting, and that ill-defined group of symptoms known as abdominal angina.

Essential hyperpiesis, i.e., hyperpiesis without gross change in the kidney, is not confined to middle or later life. A study of 16 cases ranging in age from 18 to 28 has been made by O. Moog and K. Voit.⁸ The blood-pressure of these cases varied between 140 and 215. Ten of them had constitutional anomalies, degenerative stigmata, or arthritic tendencies. Eight belonged to the asthenic type of patient. In one case the abuse of tobacco may have played a part, in another lead intoxication. The authors are of the opinion that inheritance

plays an important part in this hyperpiesia in early life. A majority of the cases showed an increase of reaction towards adrenalin, and only two were less sensitive than normal. Hypertrophy of the heart is not an invariable feature. Often cases tested showed an increase of basal metabolism. The symptoms were as varied and as frequent as in older patients.

TREATMENT.—Sir H. Rolleston⁹ reviews the treatment of patients with a high blood-pressure. It is more important to treat the underlying condition causing the blood-pressure than the blood-pressure itself, when this can be done. As preventive and prophylactic measures he recommends a periodic overhaul at the hands of a physician, just as the wise are accustomed to submit to at the hands of the dentist. This might entail a review of the conditions of life, a little less work, a little more relaxation as age advances; some restriction in diet, especially of meaty foods; regular exercise, and moderation in all things. Chronic sepsis such as may be associated with the teeth, tonsils, nasal sinuses, gall-bladder, prostate, and other parts of the body should be searched for and eradicated. A tendency to obesity should be controlled. The treatment of the patient with a fully developed high blood-pressure should be more or less on these lines. The patient should be encouraged to think that the height of the blood-pressure is not important if his life is governed by moderation. The blood-pressure should not be taken often, and the actual figure should be withheld from the patient's knowledge. The **Diet** should be restricted in protein and meat extracts, especially clear soups and sweetbread, also in strong tea and coffee. Carbohydrates should be restricted if there is a tendency to obesity or dyspepsia. Strict moderation in, or complete abstention from, alcohol is desirable. A moderate indulgence in tobacco is probably not harmful, and the soothing effect is beneficial. High blood-pressure can be reduced temporarily by rest in bed, and the benefits of a full night's rest and an occasional day in bed are not to be denied. Myocardial failure may require complete rest. As regards **Baths**, the value of hot baths is doubtful, and cold baths are harmful because they raise the pressure. A yearly visit to a spa may be a very valuable aid to ordinary treatment. **High-frequency Currents** and **Diathermy** lessen the pressure, and after prolonged courses may permanently reduce it. **Lumbar Puncture** and **Venesection** are useful temporary measures. Of drugs, **Bromides** are, according to the author, the most effective; vasodilators, such as **Mannitol** or **Erythrol Nitrate** relieve such temporary disorders as headache and insomnia. Some form of **Calomel** is desirable, either in minute doses daily or larger doses once weekly. **Chloral** in 5-gr. doses may be used temporarily.

G. G. Duncan and A. Rudy¹⁰ urge that the most efficacious treatment in myocardial failure following hypertension is a **Restricted Diet** and **Restriction of Chloride** intake.

C. Reid¹¹ states that the **Nitrite** series of drugs in normal subjects has no power of diminishing the excretory power of the kidney. This is true even in hyperpiesia using pharmacopœal doses. If the dose is pushed, the functional capacity of the kidney is diminished and there arises a marked intolerance to the drug. C. Mattei and J. Dias-Cavaroni¹² investigated various substances as to their efficacy in diminishing hypertension in cases showing no renal symptoms or cardiac failure. They find that the nitrites are uncertain in action. **Benzoyl Benzoate** has a feeble and uncertain action. Extract of **Mistletoe** (gui) lessens the tension considerably by intramuscular injection, to a less degree if taken by the mouth. **Chloral** by mouth also has a definite action. The effect of all drugs disappears a few days after cessation.

E. R. Blaisdell¹³ reports 35 cases of arterial hypertension treated with **Salt-free Diet** with a marked improvement both in the symptoms and in the level

of the blood-pressure readings. Eight of the cases may be placed in the renal class, since the urine contained variable amounts of albumin; 25 cases had a normal urine. The pressure in no case was reduced to normal. A continuance of the diet was effective in keeping the pressure at the low level.

K. Westphal¹¹ holds the view that hypertension is largely the result of an increase in the lipid content of the blood, for an increase in the blood cholesterol is found in 75 per cent of cases of genuine hypertension. He imagines that, if it is possible to overcome by some drug the loss of transudative power of the blood-vessel wall which cholesterol produces, hypertension would be counteracted. Such a substance he has found in *Rhodan*, which, in doses of 0.6 to 0.8 grm. daily, produces a fall of blood-pressure in hyperpiesis, and an amelioration in the symptoms. It is contra-indicated in definitely nephritic cases. A useful compound is one combined with a purin base which has a greater eliminative effect on the kidney.

Two papers, one by R. H. Major¹⁶ and another by A. A. James, N. B. Laughton, and A. B. Macallum,¹⁶ deal with the action of an alcoholic *Extract of Liver Substance* as a depressor body in hypotension; the former author has treated over 100 patients, but it is not possible yet to give clear indications for use in practice.

Surgical Treatment.—D. Daniélopou¹⁷ envisages the possibility of section of branches of the sympathetic system subserving vascular tonus to alleviate some of the ill-effect of hyperpiesis, just as he has been able to lessen the pain and hypertension in angina pectoris. It is an interesting suggestion, contrary to the ordinarily accepted view of hypertension, namely, that it is compensatory. But no theoretical considerations ought to stand in the way of such a method if proved to be useful.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1926, Sept. 18, 928; ²*Presse méd.* 1926, Oct. 23, 1329; ³*Arch. of Internal Med.* 1926, Aug., 158; ⁴*Jour. Amer. Med. Assoc.* 1926, Sept. 18, 925; ⁵*Munch. med. Woch.* 1926, Dec. 24, 2197; ⁶*Bull. Johns Hop. Hosp.* 1926, Oct., 229; ⁷*Lancet*, 1926, ii, 1203; ⁸*Munch. med. Woch.* 1927, Jan. 7, 9; ⁹*Lancet*, 1927, i, 41; ¹⁰*Amer. Jour. Med. Sci.* 1926, Sept., 351; ¹¹*Quart. Jour. Med.* 1926, July, 411; ¹²*Presse méd.* 1926, Aug. 7, 999; ¹³*Boston Med. and Surg. Jour.* 1927, May 19, 808; ¹⁴*Munch. med. Woch.* 1926, July 16, 1187; ¹⁵*Jour. Amer. Med. Assoc.* 1926, July 31, 317; ¹⁶*Ibid.* 311; ¹⁷*Soc. méd. Hôp. de Bucarest*, 1926, May.

HYPERPNŒA IN THE CLINICAL INVESTIGATION OF REFLEXES.

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

The investigation of the various reflexes, whether tendon reflexes, cutaneous reflexes, or visceral reflexes, is a matter of daily clinical importance. The abolition of a single reflex often puts us on the track of a correct diagnosis. The question often arises, Is the reflex really absent, or is it only, temporarily perhaps, diminished? Various devices are familiar for the reinforcement of diminished reflexes, e.g., making the patient pull in opposite directions his interlocked hands, so as to reinforce the knee-jerk or ankle-jerk; warming a patient's cold foot in order to elicit a plantar reflex, and so on. Another useful method, specially for the eliciting of doubtful deep reflexes, is by the procedure known as hyperpnœa. This consists in making the patient breathe deeply for a period of five to ten minutes, paying particular attention to expiration. In a normal individual this increases the activity of the deep reflexes and may even enable us to produce a temporary ankle-clonus or knee-clonus. If the hyperpnœa be continued, signs of muscular rigidity, amounting to tetany, temporarily appear, when, of course, the deep reflexes can no longer be elicited owing to the muscular hypertonicity. More than this, in certain cases, e.g., of tabes, polyneuritis, myopathy, etc., in which the deep reflexes under ordinary conditions were not elicited, if hyperpnœa be employed, these

PLATE XXII
HYPERTELORISM

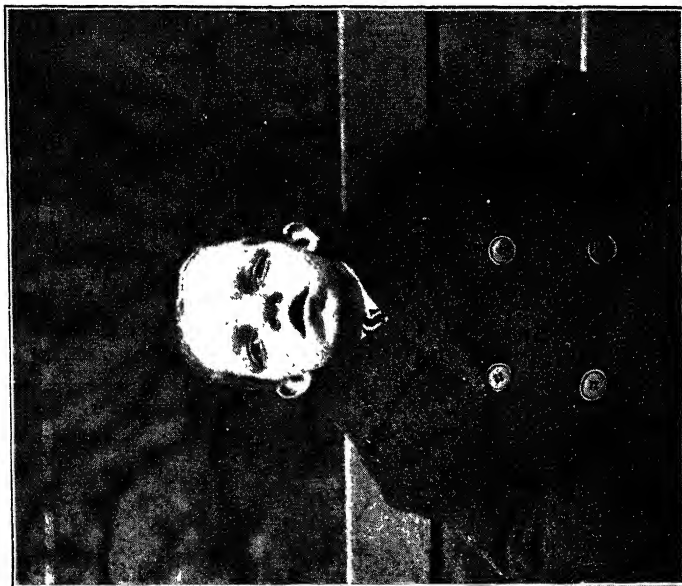


Fig. A.—Patient at the age of 11½ years.



Fig. B.—Profile view of the patient seen in Fig. A.
By kind permission of 'Archives of Disease in Childhood'

reflexes, especially the knee-jerks, can be made temporarily to reappear. S. Draganesco¹ has recorded a series of ten such cases. It has long been known that occasionally in tabes, if the patient has an intercurrent attack of hemiplegia, the knee-jerk may return on the hemiplegic side. This can only occur if the deep jerks have not been completely abolished but are merely much reduced. The same remark applies to the reinforcement of reflexes induced by the procedure of hyperpnœa. In those cases of tabes in which the deep reflexes reappear by such manœuvres, it is evident that the lesions of the posterior roots have been less intense than ordinary clinical examination had led us to believe.

REFERENCE.—¹*Presse méd.* 1926, Oct. 23, 1331.

HYPERTELORISM.

Reginald Miller, M.D., F.R.C.P.

Hypertelorism is the name given to a curious congenital cranio-facial deformity first differentiated from other cranial abnormalities by D. M. Greig in 1924. Hitherto but few cases have been recorded, but, as the condition becomes more widely known, doubtless it will be found to be less rare than is at present thought. It has two prominent characteristics: first, the cranio-facial deformity, and secondly, mental deficiency. The appearance of the child's face is peculiar chiefly owing to the 'far-apartness' of the eyes, which has been likened, with a pleasing frivolity, to the portraits of the fish-footman in *Alice in Wonderland*. In addition, the bridge of the nose is sunken and flattened. The accompanying photographs (*Plate XX*) of Dr. Drummond's case¹ give an excellent idea of the facies. All the cases hitherto reported, with the exception of F. M. B. Allen's,² have shown mental defect. The cause of the condition is thought to be a defective development of the sphenoid bone. J. V. C. Braithwaite³ has discussed its relationship to mongolism, and A. G. Ogilvie and M. M. Posel⁴ regard it as also related to oxycephaly and scaphocephaly through the mal-development of the sphenoid.

REFERENCES.—¹*Arch. Dis. in Childhood*, 1926, 1, 166; ²*Loc. cit.* 171; ³*Loc. cit.* 369; ⁴*Ibid.* 1927, 11, 146.

ICHTHYOSIS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

A. Porter¹ has investigated the basal metabolism in a series of cases of ichthyosis. He finds that 70 per cent of cases among children and 25 per cent among adults show a subnormal basal metabolic rate, and he therefore concludes that some hypothyroidism is present in a large proportion of cases of ichthyosis. This view he believes to be supported by certain clinical considerations and also by post-mortem findings. He also finds that ichthyosis in children is often accompanied by hyperthyroidism in the mother, and he suggests that the delayed appearance of this disease till after weaning is possibly due to thyroid deficiency in the infant being compensated for by the mother through the milk. He admits, however, that the degree of ichthyosis present in a given case is no guide to the basal metabolic rate in that patient. He recommends a trial of **Thyroid Extract** in all cases.

REFERENCE.—¹*Brit. Jour. Dermatol. and Syph.* 1926, Dec., 476.

IMPETIGO CONTAGIOSA.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

A. R. Balmain¹ has made a culture study of 56 cases of impetigo contagiosa. He finds: streptococci 43 times (13 times in pure culture), staphylococci 52 times (21 times in pure culture), diphtheroids 3 times (once in pure culture). He was able by human inoculation to prove conclusively that streptococci can produce typical lesions of impetigo. Mixed cultures of streptococci and staphylococci will also produce impetigo contagiosa lesions, and he believes

that both organisms may grow in symbiosis in the lesion. He recommends for treatment an **Aeriflavine Emulsion** made up as follows:—

R	Aeriflav. Hydrochlor.	Pt. 0.1	Ceræ Alb.	Pt. 4.0
	Paraffin. Liq.	Pt. 76.0	Aq.	Pt. 20.0

J. B. Ellison² has treated 20 cases with **Ultra-violet Rays**, and these were compared with 20 controls treated by other methods. He draws the following conclusions: (1) That ultra-violet rays have a slight though definite effect on cases of impetigo contagiosa. This statement is based on the fact that he finds that the average time for cure in the controls was 14½ days for those treated with equal parts of **Lotio Calaminæ** and **Lotio Nigra**, 20 days for those receiving **Mercurial Ointment**, and 10 days for those receiving **Flavine** and **Paraffin**, as against an average of 13½ days treated with local ultra-violet radiation and 12¾ days for those receiving general irradiation. (2) The general exposure is safer and more efficient than local exposure at short range in this condition. It would seem from these figures that a flavine and paraffin treatment locally gave rise to better results than those treated by ultra-violet rays.

REFERENCES.—¹*Lancet*, 1926, ii, 484; ²*Ibid.* 1927, i, 343.

INFANTILE MORTALITY AND ITS RECENT ENORMOUS DECLINE.

Joseph Priestley, B.A., M.D., D.P.H.

Everybody realizes now that the decline in infantile mortality (deaths of infants of one year of age per 1000 registered births) is an accomplished fact, and that this decline is assuming enormous proportions—far beyond anything that was anticipated or prophesied in the past. It is not generally realized, however, that this decline is the direct result of the education of mothers (and others) through the various child welfare centres that exist in all well-established and well-administered sanitary districts at the present day. Whilst the decline is admitted, it is none the less advantageous to quote, occasionally, individual statistics. The writer of this article is able to set out officially the statistics of the Borough of Lambeth (and the late Parish of Lambeth) for the last half century, during which time an enormous reduction in infantile mortality has taken place. In doing so, the writer is fully aware that similar good results are being reported from other districts, but it is none the less true that, judged by the same standards, i.e., comparisons with other districts equally congested and crowded as Lambeth, the Lambeth statistics have not yet been beaten, and it is extremely unlikely that they will be, having regard to the fact that Lambeth has always regarded child welfare work (especially voluntary work) as being a most important plank—if not the most important—in preventive measures dealing with the health of the nation, viz., the attacking of infantile and child mortality that have caused such havoc in the past, and are still causing it in certain districts.

The Lambeth figures cover a quarter of a century (1901–25), and their mere statistical tabulation will satisfy all that Lambeth's boast is justified. It may be added that the last published official figures (for 1926) show records the lowest ever tabulated in connection with either the new Borough or the old Parish.

1. *Infantile Mortality (Deaths of Infants under 1 Year of Age)*.—288 corrected deaths were registered during the year 1926 amongst infants under 1 year of age, as compared with the following *average* yearly numbers during the past 25 years, arranged quinquennially and decennially:—

5 years, 1921–25 (Borough)	..	419.4
10 years, 1911–20 (Borough)	..	619.7
10 years, 1901–10 (Borough)	..	1020.1
Average for 25 years, 1901–25: 686.4.		

The existing records that are available allow even a further comparison (beyond a quarter of a century ago) to be made—viz., for the decennium 1891–1900—as follows: 1891–1900 (Parish), 1858.5. In other words, there has been during 1926 a drop of 58.1 per cent as compared with the actual yearly average figures during the past 25 years, and a drop of 78.8 per cent as compared with the average figures for 1891–1900 (Parish).

Expressed in rates per 1000 of the total births registered (uncorrected) for the quinquennial and decennial periods, the results are as follows: 1926, 38.4; 5 years, 1921–5 (Borough), 50.7; 10 years, 1911–20 (Borough), 77.2; 10 years 1901–10 (Borough), 115.3 (average rate for the 25 years 1901–25, 81.0), and 10 years 1891–1900 (Parish), 146.1, representing a drop of 53.1 per cent, in the rate for 1926, as compared with the average rates for the past 25 years, and a drop of 73.7 per cent, as compared with the average rate for 1891–1900 (Parish).

These figures (in regard to infantile mortality) can only adequately be described as extraordinary.

2. *Child Mortality (Deaths of Children between 1 and 5 Years of Age).*—199 corrected deaths were registered during the year 1926 amongst children between 1 and 5 years of age, as compared with the following *average* yearly numbers during the past quarter of a century (25 years), arranged quinquennially and decennially:—

5 years, 1921–25 (Borough)	..	226.8
10 years, 1911–20 (Borough)	..	338.9
10 years, 1901–10 (Borough)	..	483.4
Average for 25 years, 1901–25: 349.7.		

The *average* yearly number for the Parish of Lambeth during the decennium 1891–1900 is 717.7. These figures represent decreases of 43.1 and 72.3 per cent respectively, when comparing 1926 with (a) the past 25 years, and (b) the 10 years 1891–1900 (Parish).

Expressed in rates per 1000 of the estimated population of the particular age-period (1–5 years), the results are as follows: 1926, 10.6; 5 years, 1921–5 (Borough), 12.1; 10 years, 1911–20 (Borough), 16.5; 10 years, 1901–10 (Borough), 20.4 (average rate for the 25 years, 1901–25, 16.3); and 10 years, 1891–1900 (Parish), 27.9, representing respective decreases of 36.1 and 62.0 per cent, when comparing the rate for 1926 with the average rates for (a) the past 25 years and (b) the years 1891–1900 (Parish).

3. *Total Infantile and Child Mortality (Deaths of Infants under 1 Year of Age and of Children between 1 and 5 Years of Age).*—487 total corrected deaths were registered during the year 1926 amongst infants under 1 year of age and children between 1 and 5 years of age, as compared with the following *average* yearly numbers during the past quarter of a century (25 years), arranged quinquennially and decennially:—

5 years, 1921–25 (Borough)	..	646.2
10 years, 1911–20 (Borough)	..	958.6
10 years, 1901–10 (Borough)	..	1503.5
Average for 25 years, 1901–25: 1036.1.		

The *average* yearly number for the Parish of Lambeth during the decennium 1891–1900 is 2070.2. There have been respective savings of 52.9 and 76.5 per cent, as between the 1926 figures and those for (a) the 25 years, 1901–25, and (b) the 10 years, 1891–1900 (Parish).

From a statistical point of view it is not satisfactory to give the figures for the total infantile and child mortality based upon the average rates per 1000 of the estimated population of the age-period under consideration (under 5 years) because the Registrar-General has laid down that rates calculated in connection with infantile mortality (deaths under 1 year of age) are to be

based upon per 1000 of the total number of registered births, whereas all other rates for all other age-periods are to be based upon per 1000 of the total estimated populations of such age-periods. The results, however, as a matter of fact, are practically the same, viz., respective drops of 50 per cent and 70 per cent, as between the rates for 1926 and those for (a) the past 25 years, and (b) the years 1891-1900 (Parish).

The figures (in regard to *decreased* general child mortality) are as startling as those relating to *decreased* infantile mortality. This was, however, to be expected, in view of expert prophecies, as the more infantile lives that are saved the more children's lives generally will be saved *pari passu*. The age-period under 1 year of age is the most dangerous to life, and, if an impression can be made on such age-period in the way of reducing mortality (and, correspondingly, morbidity), it naturally follows that the immediate succeeding age-period (1 to 5 years) should be affected proportionately, this latter age-period (1 to 5 years) being in no sense so dangerous to life as the former age-period (under 1 year of age). Taken over a stretch of years—and the wider the stretch of years, the better—the figures are, as already stated, extraordinary, if not incredible.

It used to be customary to regard an infantile mortality-rate of 100 deaths (corrected) per 1000 total registered births (uncorrected) as the *ideal* to work up to, or down to, and experts used to make an *ex cathedra* statement to the effect that any lower figure could not be reasonably expected on account of the necessity for allowing a fixed and definite margin for infants that are born to die within twelve months of birth from prematurity and marasmus, and such-like classified diseases (inherited, or constitutional, and otherwise), from which that particular age-period (infants under 1 year) is liable to suffer, and to which the infants concerned succumb in very large numbers—or used to succumb in past years, not only in Lambeth borough and parish, but in other Metropolitan districts and provincial cities and boroughs. Few districts (if any) can show greater proportional decreases than Lambeth borough at the present day.

These remarkable results have only been obtained through the activities of the Borough Council in connection with maternity and child welfare work during the 25 years of the present Borough's existence.

Mention must be made of the help given by the many various voluntary welfare centres that have now been amalgamated, and are comprised officially within the Lambeth Maternity and Child Welfare Scheme. Constant and unrelenting energy has had to be displayed by the official and voluntary workers throughout the borough, the latter (voluntary workers) having now been finally transferred practically as officers of the Borough Council under the provisions of the Lambeth Scheme, which was officially inaugurated, as a scheme, in 1918 under the powers of the Maternity and Child Welfare Act, 1918, although similar work had previously been carried out voluntarily. The healthy growth of the work has been secured by the fertilizing benefits of the Borough Council's monetary annual grants-in-aid, supplementing the grants of the Ministry of Health and the late Local Government Board and the Board of Education.

The net saving in infantile and child mortality (and morbidity) has been enormous within the Borough of Lambeth during the last 25 years, and can be approximately stated as a total saving of 11,275 lives amongst infantile and child life, of which 8150 may be classified as infants under one year of age. May the good work long continue! The beginning of life is the right end to begin at, and the term 'beginning of life' must include the intra-uterine period. In other words, the 'antenatal' clinics are an integral part of all welfare centres—no centres being complete without such. Strict care of antenatal

life, of natal life (1 to 12 months of age), and of child life (1 to 5 years of age) will amply reward a Sanitary Authority with the results that will be obtained in lowered infantile and child mortality and morbidity. (*See also ANTE-NATAL CARE.*)

INFANTILE PARALYSIS. (*See POLIOMYELITIS, ACUTE.*)

INFECTIOUS DISEASES : PUBLIC HEALTH REGULATIONS, 1927.

Joseph Priestley, B.A., M.D., D.P.H.

The Public Health (Pneumonia, Malaria, Dysentery, etc.) Regulations 1919 have been revoked. In other words, the Great War is over and demobilization has now ceased, so that it is no longer necessary to make special provision against certain 'war' infections conveyed by men returning from the various parts of the war area. Trench fever, malaria, and dysentery are no longer to be catered for *specially* as 'war' diseases. Trench fever has been actually omitted entirely from the new Regulations, but malaria, dysentery, and pneumonia are still retained—*induced* malaria to be also specially notified, when used as a remedial measure in nervous diseases in institutions, in the case of patients who may be likely to be liable (in consequence of such induced malaria) to relapses of malaria—the notification to be sent to the health officer of the district in which the patient proposes to reside (when discharged from institution) *at least four days before discharge*. A special form of notification is prescribed under the new Regulations in such cases.

Amœbic and bacillary types of dysentery are notifiable, and enteric fever includes paratyphoid fever. Pneumonia includes (a) acute primary pneumonia and (b) influenzal pneumonia. The new Regulations come into force on Jan. 1, 1928, and local authorities are required to give notice *forthwith* to local medical practitioners.

INFLUENZA.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—In January, 1927, the Health Section of the League of Nations¹ reported that a mild form of influenza was prevalent in Holland, Belgium, Norway, and Denmark. The epidemic in Switzerland was highest in Bâle, Geneva, and Berne, and was then decreasing. The deaths were mostly among old persons. The disease was prevalent in Central, Eastern, and Southern France. It reached its maximum in Paris in the middle of December. In England the general death-rate increased during the last week in December, but serious prevalence of influenza was not reported. There was no universal prevalence of the disease in Sweden, Germany, Czecho-Slovakia, Italy, Scotland, or Ireland. In Spain the disease was generally benign.

In opposition to the views of the lay press, G. Maly² illustrates the severity of the influenza epidemic in Berlin by stating that 30 per cent of his cases showed evidence of grave infection, often accompanied by toxic features. Of 58 cases under his care, 6 were fatal, a mortality of 10 per cent, death being due in 4 to bronchopneumonia, in 1 to acute encephalitis, and in 1 to septicæmia.

A. M. Burgess³ remarks that it is not only the mortality and morbidity from pneumonia and other complications of influenza which make it important, but the great loss of time and efficiency caused by simple uncomplicated cases. At Brown University during the academic year, out of a student population of approximately 1200, 149 cases of influenza occurred and involved a total of 146 days' absence from class work, or more loss of time than any other illness. In the year 1925-6 the figures were much more striking owing to the March epidemic. The cases of influenza amounted to 359, of which 284 occurred in March and caused a total absence from class work of 1644 days.

SYMPTOMS AND COMPLICATIONS.—M. Cannac⁴ has drawn up the following classification of the varieties of *influenzal laryngitis*: (1) Simple catarrhal form, of which the symptoms and course are those of ordinary catarrhal laryngitis. (2) Infiltrative oedematous form. This variety which, like the first, is very frequent, is characterized by a feeling of obstruction in the pharynx and larynx, and violent pain on swallowing and phonation. The symptoms become aggravated in the evening and reach their height at midnight, but almost entirely disappear in the morning. (3) Ulcerative form. In mild cases small superficial ulcers are found on the posterior or less frequently the anterior third of the vocal cord. In some cases the ulcers are deeper, and invade the whole length of the cord. The lesions are usually bilateral. This form is very refractory to treatment, especially in those who have to make much use of their voice. (4) Phlegmonous form. This is the first stage of an intralaryngeal abscess which may become absorbed or open spontaneously. (5) Necrotic form. In this variety the perichondritis may be localized to the thyroid or cricoid cartilage, or the whole of the larynx and trachea may become involved, death taking place in three or four days.

R. E. Taylor,⁵ who reports a sporadic case, states that *pericarditis* complicating pneumonia and empyema was frequent during the epidemics of 1918-19 and 1924. In 300 necropsies of patients who died of influenzal pneumonia, Stone found pericarditis in 24 per cent, usually secondary to empyema, the infecting organism being usually the pneumococcus or hæmolytic streptococcus. In only a few cases, such as that reported by Malloch and Rhea, has the influenza bacillus been found. Taylor's case occurred in a boy of 6, who died after two days' illness with symptoms of laryngitis and pneumonia. Purulent pericarditis was also found post mortem, and a pure culture of the influenza bacillus was obtained from the lungs and pericardial fluid.

A. S. Hyman⁶ records three cases of *heart-block* following mild attacks of influenza in a woman of 28, a girl of 18, and a man of 63 respectively. His experience has been that myocardial damage bears no relation to the character of the original attack, and that the mild and unrecognized cases show the most severe cardiac complications.

Y. Goia⁷ draws attention to the occurrence of *painful nephritis* which occurred as a complication of influenza during an epidemic at Cluj in Roumania in 1925. He attributes the severe lumbar pain from which the patients suffered to intracapsular tension, which was increased by the occurrence of small emboli and renal congestion. In some cases the pain radiated to the thorax and shoulder, probably owing to the congestion extending to the perirenal tissue.

B. Cimbelfmann⁸ records his observations on the *menstrual changes* in influenza in a paper based on a study of 343 cases. In 84 cases no changes at all were observed, and in the rest there were various abnormalities, such as menorrhagia, early appearance or on the other hand postponement of the menstrual period, and different forms of amenorrhœa, which Cimbelfmann attributes to morbid changes in the ovary as the result of the general infection.

G. A. Schaly,⁹ who records an illustrative case, states that *optic neuritis* following influenza is not very uncommon, as it occurs, according to Groenouw, in about 3 per cent of all cases. The remarkable feature in his case, which was in a woman 37 years of age, was that the optic neuritis was unilateral. The urine was free of albumin, and the patient showed no signs of nephritis.

TREATMENT.—P. Ludewig¹⁰ treated twenty cases of influenza by **Intra-muscular Injection of their Own Blood**, as recommended by Rhode and Tenkhoff, two doses of 10 c.c. each being given, with remarkably good results.

REFERENCES.—¹*Public Health Rep.* 1927, xlii, 97; ²*Deut. med. W'och.* 1927, 829;

²*Amer. Jour. Med. Sci.* 1927, clxxiii, 819; ⁴*Rev. de Laryngol. d'Otol. et de Rhinol.* 1926, xlvii, 571; ⁵*Jour. Amer. Med. Assoc.* 1927, lxxxix, 347; ⁶*Med. Jour. and Record*, 1926, cxxiv, 698; ⁷*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1926, 1597; ⁸*Schweiz. med. Woch.*, 1926, 1149; ⁹*Nederl. Tijds. v. Geneesk.* 1926, ii, 1853; ¹⁰*Deut. med. Woch.* 1926, 2121

INTESTINES, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

Swallowed Foreign Bodies in the Intestines.—L. Carp¹ publishes a study of 48 cases in which a foreign body had been swallowed and traversed the bowel. About half were sharp, mostly pins; and half dull, such as coins, toys, fruit-stones, etc. Some were curious, including a radium tube and a stomach tube! The sharp bodies passed through in about seven days, and the others in five days. In 6 cases operation was performed, and, of these, 2 died. Both these were deaths from intestinal obstruction. In 2 other cases the foreign body perforated the bowel, and gave rise to peritonitis. A review of the literature shows that the intestine has an almost uncanny power of passing in safety all sorts of unlikely objects. When the mucosa is pricked, it retracts and leaves a concavity at that spot, which has the effect of allowing room for a pointed body such as a pin to swing broadside on, and thus the blunt end is carried forward and comes to lead the way. Even a 6-in. dinner fork has passed! A dog, given 50 needles, half with the points forward and half the other way, evacuated all but 2 with the heads leading. Out of 800 needles given to cats and dogs, none did any harm. It has been handed down by tradition that ground glass is a deadly poison, but Simmons and Von Glahn found that it was innocuous to dogs.

Intestinal Tuberculosis.—L. Brown and H. L. Sampson² report that intestinal ulcers are frequently healed in persons suffering from phthisis, after a course of Ultra-violet Light Rays,

Hæmorrhage from the Bowel in Infants.—Copious bleeding from the bowel, without the colic and obstruction symptoms of intussusception, may be due to inflammation of Meckel's diverticulum, and may be so severe as to need removal thereof. It seems not to be very infrequent. I. A. Abt and A. A. Strauss³ have had three cases, and mention many more from the literature. The ages ranged from eleven to twenty-four months.

Toxæmia of Intestinal Obstruction.—B. W. Williams⁴ believes that the toxæmia of intestinal obstruction is due to absorption of the toxins of *B. welchii*, the organism responsible during the War for gas gangrene. These bacteria may be found in the intestine in great numbers under such circumstances. The pathological changes are similar. He therefore advocates the administration of Burroughs and Wellcome's Anti-gas-gangrene Serum, 80 c.c. intramuscularly, both as a remedy and as a prophylactic when obstruction is expected. It is repeated daily in 40-c.c. doses. Several surgeons at St. Thomas's Hospital have been using it, and the death-rate from obstruction and peritonitis is said to be reduced from 24.8 per cent to 9.3 per cent. Of course operative treatment is carried out as usual. It is claimed that an action of the bowels is often obtained soon after the injection has been given.

E. P. Coleman⁵ emphasizes the value of Hypertonic Salt Solution, administered freely subcutaneously, after the method of Haden and Orr. A 3 per cent solution is given, and about a quart may be run in, taking a couple of hours or so. The bowels may act violently when a small quantity of the salt has been absorbed (Ross). Blood chlorides are deficient during the toxæmia of intestinal obstruction.

Intestinal Obstruction after Appendicitis.—A dangerous complication after operation for a perforated appendix is not infrequently seen, in that the abdomen swells, there is some vomiting, and the bowels will not act. This may be due to simple ileus, to peritonitis, or to adhesions kinking the coils of

intestine. The condition is discussed by G. W. Carlson⁶ and V. F. Marshall. It is of the greatest importance to recognize the cases with a genuine kinking or obstruction by mechanical means, as operation is the only chance they have of recovery. The symptoms may come on at any time, early or late; it is the early ones that are most difficult to diagnose. When an enema fails to

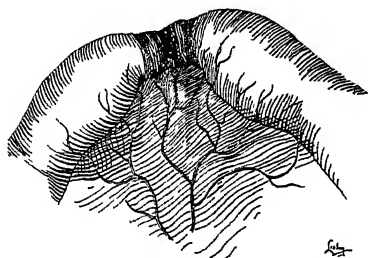


Fig. 59.—Limited annular gangrene of the small bowel.

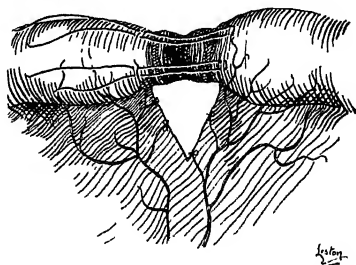


Fig. 60.—Mesentery excised; mattress stitches introduced.

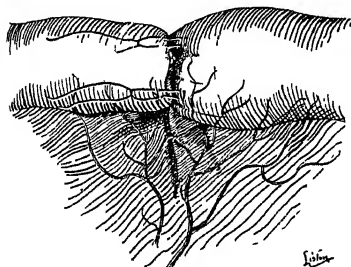


Fig. 61.—Intussusception made downward, edges of mesentery approximated; mattress stitches being tied.

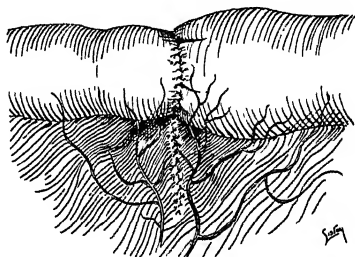


Fig. 62.—Intussusception secured by circular suture burying mattress sutures; mesentery sutured.

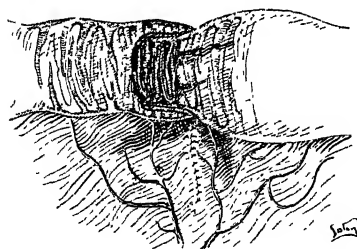


Fig. 63.—Cross-section of intussusception downward.

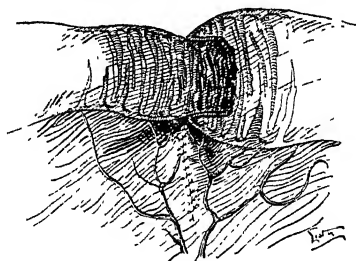


Fig. 64.—Cross-section of intussusception upward.

(Figs. 59-64 re-drawn from 'Surgery, Gynecology and Obstetrics'.)

bring away either flatus or feces in a patient with such symptoms, a second operation must be performed at once. [When the condition follows immediately on an operation for appendicitis with peritonitis, and it is difficult to distinguish between post-operative ileus and genuine obstruction, if ordinary remedies fail, we have been in the habit of solving the problem quickly by the

so-called 'triple attack'—a dose of croton oil (2 min.), followed five hours later by a turpentine enema, and a dose of pituitary extract whilst the enema is in the colon. If this fails, it is not ileus, and it is wiser to open the abdomen.—A. R. S.]

Internal Hernia.—Christophe and Hartmann⁷ advise that when in operating for hernia into a paraduodenal fossa it is found that the bowel cannot readily be withdrawn, the best procedure is to perform duodenojejunostomy.

Operative Technique.—The method of invagination, rather than resection or the formation of an artificial anus, advocated by German surgeons for strangulated hernia (see HERNIA, p. 220), may also be used for short loops of gangrenous gut whatever the cause. J. E. Summers⁸ gives instances, with illustrations (Figs. 59-64). It is usually better to invaginate the gut downwards, like an intussusception, and to crush it with a crushing clamp; a length up to 4 in. may be dealt with in this way. Unless the gangrenous portion is small, it is better to take a wedge out of the mesentery, as figured.

Methods of intestinal suture continue to be published. During the past five years, according to Fraser, no less than 31 different procedures have been put forward. N. M. Dott⁹ describes a technique, originally used by physiologists for making Eck's fistula, which has the advantage of not soiling the peritoneal cavity, and of being available for both end-to-side and lateral anastomoses, but not end-to-end. The coils of bowel are laid side by side, the usual seromuscular suture-line is inserted behind the proposed anastomosis, and the seromuscular coats, but not the mucosa, are incised. A second suture-line is then inserted, uniting the two submucosæ and cut edges of the seromuscular coats. A long linen thread is then passed by a needle through the whole length of the mucosa of both coils of gut, from one end of the incision to the other, forming a long loop. This loop of course enters the lumen, and the two ends are brought out close together. Next, the anterior suture-line, picking up the submucosæ and cut edges of the seromuscular coats, is inserted, and then a simple seromuscular inverting stitch. The inner stitch secures the blood-vessels. The anterior suture-lines end just where the loop of thread emerges. By pulling on this loop, the septum, composed of the two mucosæ, is broken down without spilling a drop of contents, and the loop is pulled quite through and extricated (Fig. 65). It must be rough and strong. When used for end-to-side anastomosis the ileum is opened, but not the highly infective colon. It is too lengthy to be given here.

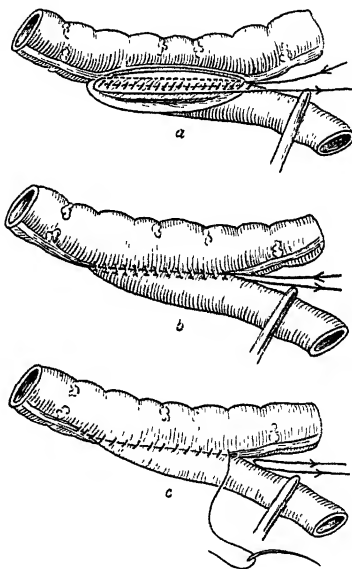


Fig. 65.—Norman Dott's method of end-to-side or lateral anastomosis. *a*, Ileum controlled by clamp and cut obliquely. Posterior seromuscular and seromuscular-submucous sutures placed. Cutting thread inserted into lumen of colon. *b*, Anterior seromuscular-submucous suture. *c*, Anterior seromuscular inverting suture. Anastomosis lumen established by thread loop cutting colonic mucous membrane. (Re-drawn from the 'Edinburgh Medical Journal'.)

Spinal Anæsthesia and Intestinal Obstruction.—The discovery that an intraspinal injection of stovaine will often cause evacuation of the bowel in cases of ileus has aroused much interest in France, and a number of surgeons continue to write about it. It often fails. If it is going to succeed, the effect will be seen within a few minutes. It will work even in cases of strangulated hernia, so it cannot be relied on to distinguish between paralytic ileus and organic obstruction. Nor is the treatment devoid of danger, especially in a patient already showing signs of collapse. Duval,¹¹ summing up a discussion on the subject, found that, in 400 cases tried, it was successful in reducing a strangulated hernia in 27 cases out of 257 (10 per cent); in paralytic ileus there were 30 successes in 44 cases (68 per cent); and in mechanical obstruction 16 successes in 99 cases. It is quite evident, then, that it is only in patients with paralytic ileus that it ought to be considered, and even then there are other safer remedies to be tried first.

REFERENCES.—¹*Ann. of Surg.* 1927, April, 575; ²*Jour. Amer. Med. Assoc.* 1927, May, 1472; ³*Ibid.* 1926, Sept. 991; ⁴*Lancet*, 1927, 1, 907; ⁵*Jour. Amer. Med. Assoc.* 1927, April, 1060; ⁶*Ann. of Surg.* 1926, Oct., 583; ⁷*Bull. et Mém. Soc. nat. de Chir.* 1926, lii, 1000; ⁸*Surg. Gynecol. and Obst.* 1927, March, 374; ⁹*Edin. Med. Jour.* 1927, March, 55; ¹⁰*Surg. Gynecol. and Obst.* 1927, March, 378; ¹¹*Bull. et Mém. Soc. nat. de Chir.* 1927, March, 445, 472, 539, 596.

INTRAVENOUS THERAPY. (See PHARMACOLOGY AND GENERAL THERAPEUTICS.)

INTUSSUSCEPTION.

John Fraser, Ch.M., F.R.C.S.Ed.

CLASSIFICATION AND DIAGNOSIS.—J. F. H. Stallman¹ questions the accuracy of the existing classification of intussusception. In a descriptive article on 'chronic intussusception' he points out that the term is open to criticism, because it is apt to be accepted as meaning a recurrent intussusception, while actually it concerns the condition in which a recurrent intussusception has become a permanent invagination. He visualizes an element of danger underlying the confusion, for, while the recurrence of an intussusception may favour delay in the hope that spontaneous reduction may again occur, a permanent intussusception is a condition which almost invariably progresses to a fatal termination. The sequence of events which leads to the development of a chronic intussusception is of interest. There is a phase of occurrence, spontaneous reduction, and recurrence, and the result of this is to allay suspicion as to the serious nature of the condition. Ultimately the invagination becomes a permanent one, 'entering' and 'returning' surfaces become adherent, and reduction becomes impossible. The condition is virtually limited to the large intestine; the appendix may share in the error, and, as Waugh pointed out, excessive mobility of the cæcum on account of an abnormally long mesentery to the large intestine is generally found to be present.

A complete intestinal obstruction does not occur in these cases, and their clinical history is therefore distinctive. There are recurrent attacks of colic, extending, it may be, over a period of months. Vomiting may be an occasional event; sometimes it is excessive; it is reflex in source. Blood may be entirely absent from the stool, but it is usually present in slight amount; in a few cases it is excessive, and in this event diarrhœa is often an accompaniment. The time incidence of the bleeding is important—it usually appears during or immediately following an attack of colic. There is no absolute constipation except as a terminal event; on the other hand, there is a distinctive irregularity. There is loss of appetite and rapid emaciation, and a tumour may be apparent or palpable in the abdomen. Urinary symptoms are sometimes present, as frequency of micturition or as referred penile pain; these have been described

by Waugh as due to the direct pull of the abnormal mesocolon throwing the weight of the intussusception upon the kidneys.

With such a group of symptoms it is evident how easily errors in diagnosis may occur. Paroxysmal attacks of abdominal pain and tumour formation are the basic diagnostic signs; the modification of the other so-called classical signs of intussusception are due to variations in the structure of the alimentary tract, and their significance in this respect should be properly appreciated. Stallman points out that the cause of death in chronic intussusception is perforation of the gut above the lesion with secondary peritonitis.

Wilfred Vickers,² writing on diagnosis, brings out two points of interest. One is in relation to the influence of diet upon the genesis of the disease. Breast-feeding was recorded in a large percentage of the cases, a finding which is contrary to the usual opinion that the irritation induced by injudicious artificial feeding is often the originating factor in the disease. The second point of interest bears upon this question, and is in fact somewhat contradictory of the former. Vickers has grouped the cases according to the months at which they occur, and his conclusion is "that many of the cases occur round the time of the festive season, when indiscretion in diet is liable to occur."

TREATMENT.—In the past year several papers have appeared discussing the treatment of acute intussusception by **Non-surgical Reduction**. S. Mourad³ strongly favours the method, which he says is associated with a smaller mortality than surgical reduction. The child is anæsthetized to complete relaxation, and partial reduction is secured by taxis through the abdominal wall; thereafter, whether reduction is considered to be complete or not, the colon is injected with water, using an enema syringe and Oser's sound. If the attempt fails it is not repeated, but laparotomy is at once carried out.

C. E. Farr,⁴ while advising laparotomy in the great majority of cases, practises **Air Inflation** under certain conditions, when "it would seem safer to carry out this procedure than to do a laparotomy in very adverse circumstances." We presume that the qualification applies to the position and surroundings of the patient and not to the local surgical condition. Deep anæsthesia is induced, and the air is injected by means of a Davidson syringe.

Perhaps the most suggestive article on this subject is that by P. L. Hipsley⁵. One hundred consecutive cases were submitted to treatment by **Hydrostatic Methods**, and in 62 cases complete reduction was secured. In one case of this group, death occurred as the result of a minute perforation in the wall of the ileum, an accident which Hipsley ascribes to palpation of the abdomen while the bowel was still distended with fluid. Of the 38 cases submitted to operation on account of failure to reduce, 4 succumbed, 2 being cases in which resection was necessitated. The total mortality in the hundred cases recorded the surprisingly low figure of 5 per cent.

The technique of the injection is simple. Warm water or saline is used; the height of the head of the column must not exceed $3\frac{1}{2}$ ft., and in the majority of cases 3 ft. is a safer level. The injection is given through a No. 15 catheter, which is passed into the bowel for three or four inches. The buttocks are pinched closely around the catheter in order to prevent the escape of the fluid, and for this reason vaseline must not be used when the catheter is introduced in case the parts slip. The fluid is retained for two minutes, then a second injection is given; a third is sometimes administered. The signs of successful reduction are; (1) The presence of abdominal distention after reduction under anæsthesia, when prior to reduction the abdomen was soft and flaccid; (2) The canary-yellow colour of the mucus and the specks of fæces in the second and third return after injection; (3) The presence of gas bubbles in the second and third return; (4) Vomiting and escape of bile-stained fluid

from the nostrils during the third injection and whilst the child is deeply under the anæsthetic; (5) The absence of a definite tumour after injection, when it was easy to feel one before.

The record of Hipsley's paper is an impressive one, for the results he has obtained are lower than any operative results hitherto recorded. It would seem that we must readjust our impressions of non-surgical reduction. Most of us have never given this method a trial—we have accepted the tradition handed on from one to another that operative interference is the only reliable course to pursue; but in view of records such as those of Hipsley it would seem that the method is worthy of a fuller consideration than it has previously received.

There is one aspect of the method which makes a peculiarly practical appeal. We are agreed that one of the major risks of operative interference is in connection with the long abdominal incision; the injection treatment, even if it fails to undo the invagination completely, invariably succeeds in reducing it so that the intussusception returns to the point at which the majority of intussusceptions begin, the ileocæcal angle. Here a gridiron muscle-splitting incision gives a safe and sufficient access through which the reduction is completed. None of those who have written on the subject claim infallibility for the method, and all are careful to add that, in the event of failure, there must be no further delay in adopting operative measures.

The Anæsthetic in a case of intussusception is a matter of great significance. The disadvantages of ether and chloroform are recognized. Hamilton Bailey⁶ recommends spinal anæsthesia; Stovaine in Saline is used, and 0.2 c.c. is the standard dose, this varying, however, with the weight of the baby. Fourteen cases were operated on in this series with a single death. The great advantage of the method is the ease with which the abdominal wall can be closed.

REFERENCES.—¹*Ann. of Surg.* 1926, Nov., 735; ²*Med. Jour. of Australia*, 1926, Aug. 14, 206; ³*Arch. Dis. in Childhood*, 1926, 1, Dec., 323; ⁴*Ann. of Surg.* 1926, Oct., 588; ⁵*Med. Jour. of Australia*, 1926, Aug. 14, 201; ⁶*Lancet*, 1926, 11, 648.

JACQUET'S DERMATITIS. (*See* DERMATITIS OF DIAPER REGION.)

JAUNDICE, INFECTIVE.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—E. T. Morgan¹ states that during the period 1925 to March, 1926, more than 200 cases of benign jaundice, differing in several respects from Weil's disease but with many features resembling it, occurred in the Midland and Eastern counties round Northampton. All the cases but two were mild, and only one was fatal. Under no circumstances was it possible to obtain convincing proof of the spread of infection from one focus to another. With the exception of the city of Peterborough all the outbreaks occurred in small villages which did not have any close communication with one another, several intermediate villages being immune. The mode of infection was probably personal contact. Several villages were infested by rats, but some of the affected localities, including Peterborough, were free from these vermin, so that it was unlikely that rats played an important part in the dissemination of the disease. Although bacteriological and serological investigations were negative as regards *Leptospira icterohæmorrhagiae* or any other causal agent, the incubation and prodromal periods, abdominal pain, jaundice, bile in urine, and changes in the liver were common to this outbreak and spirochaetosis icterohæmorrhagica. On the other hand, none of the patients in the present epidemic showed any hæmorrhages, which are a constant feature of spirochaetal jaundice.

The increasing incidence or better recognition of spirochætosis icterohæmorrhagica in Holland, to which allusion was made last year (*see* MEDICAL ANNUAL, 1927, p. 240), has been recently illustrated by P. C. Cleynert, junr.,² W. A. Timmerman,³ and G. C. E. Burger.⁴ Timmerman states that Schuffner had informed him that he had been able to collect 25 cases with a mortality of 32 per cent, which rose to 45 per cent in cases following a fall into water. Both Cleynert's and Burger's cases occurred after use of a swimming bath. H. H. Towler and J. E. Walker⁵ record the seventh proved case of spirochætal jaundice to be reported in North America, but express the opinion, which is also held by J. M. Hayman, junr., and F. B. Lynch, junr.,⁶ that the disease is much more prevalent in that country than is supposed.

TREATMENT.—In view of the increasing number of cases of spirochætal jaundice in Holland, Timmerman³ states that a **Therapeutical Serum** has been prepared at the Dutch Serological Institute at Utrecht by injecting rabbits with *Leptospira icterohæmorrhagica*. Rabbits are used instead of horses, as the latter take a very long time to become immunized and require enormous quantities of leptospiræ. The serum should be given as soon as possible after the diagnosis has been made. The intramuscular route should be used except in very severe cases, when the serum should be given intravenously. The dose will depend on the stage of the disease and the severity of the attack. An initial dose of 30 c.c. is not excessive. The further course of the disease will determine whether the dose need be repeated or not.

REFERENCES.—¹*Bull. de l'Office internat. d'Hyg. Publ.* 1926, 1399; ²*Nederl. Tijds. v. Geneesk.* 1927, i, 562; ³*Ibid.* 1572; ⁴*Ibid.* 2460; ⁵*Jour. Amer. Med. Assoc.* 1927, lxxix. 86; ⁶*Amer. Jour. Med. Sci.* 1927, clxxiii, 80.

JOINTS, LOOSE BODIES IN. (*See* X-RAY DIAGNOSIS)

KALA-AZAR. (*See also* ORIENTAL SORE.)

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

ETIOLOGY.—Little further progress has been made during the year regarding the sand-fly infection of kala-azar, and the final proof of transmission of the disease by these biting insects is still wanting. Detailed accounts of investigation on the subject will be found in papers by L. Napier and R. O. A. Smith¹; H. E. Shortt, P. J. Barraud, and A. C. Craighead²; and K. Chand and C. S. Schaminath.^{3, 4}

CLINICAL.—G. Pittaluga⁵ has found infantile kala-azar to be widespread in Spain, both in the eastern and southern provinces and in the interior to the south of Madrid. Investigation regarding the infection of dogs showed that only 0.54 per cent of 558 dogs taken at random were infected, but 11 per cent of 52 in houses with human cases of leishmaniasis showed this parasite; he thinks they are both probably infected from the same source, and not that man is infected from the dogs by insects. G. C. Low and W. E. Cooke⁶ have recorded the case of a child born in England of a mother suffering from kala-azar who subsequently developed the disease, which they believe to have been congenital. B. M. Das Gupta⁷ records that 'dermal leishmanoid', or small skin nodules containing *L. donovani*, without visceral infection, is seen nearly every week in the skin clinic of the Calcutta School of Tropical Medicine; small portions allow of culture of the organism. Further cases are met with not following insufficient treatment of the disease, so this common condition requires further study. C. C. Basu,⁸ also working in Calcutta, while staining kala-azar tissues by the silver method to study the reticular tissue formation, found that the parasites also stain well by the Bielchowsky-Cajal process modified by Gorriz.

DIAGNOSIS.—G. Shanks and G. P. Khan⁹ discuss the diagnosis of the typhoid group of fevers from early kala-azar, which may so closely simulate them. As the result of four years' work they found the Widal test by Dreyer's technique to give reliable indications of the former disease after five to twelve days, and cultures from the blood by the following method are of great value. Ten c.c. of blood are taken from a vein, and 7 c.c. of this are diluted with 10 c.c. of normal saline with 1 per cent of sodium citrate: most of this is cultivated for typhoid organisms in 50 c.c. of glucose broth, and a small quantity on N.N.N. medium, and the remaining 3 c.c. of blood is used for separating serum for the aldehyde test and agglutination reactions. In all cases positive with the aldehyde test, kala-azar was found to be present. Charts of typhoid following kala-azar and vice versa are given.

Yet another serum test for kala-azar is brought forward by R. N. Chopra, J. C. Gupta, and J. C. David,¹⁰ who when testing the effect of a number of pentavalent antimony preparations on the serum of kala-azar patients found they produced a precipitate, but not with the blood of other subjects. Further, the amount of precipitate was much in proportion to the efficiency of the drug, so they suggest this test as a preliminary one before trying new antimony preparations in the treatment of kala-azar. L. E. Napier¹¹ has found this new reaction to run parallel with the aldehyde reaction, and he agrees with Chopra that the intensity of the reaction is in proportion to therapeutic efficacy.

The control of kala-azar on tea estates in Assam is dealt with by L. E. Napier and P. Foster,¹² who confirm the great value of the transfer of the coolie population from an infected to a new site, together with segregation of the sick and contacts, as first shown by J. Dodds Price and L. Rogers, and they give a chart showing the complete eradication of the disease by this plan before the present effective antimony treatments were available, and another illustrating the value of the antimony treatment in eliminating the disease at a less cost than the older plan.

TREATMENT.—L. E. Napier¹³ records a careful analysis of 104 unselected cases of kala-azar in Calcutta treated by *Stibosan*, the present name of the proprietary preparation formerly called von Heyden 471. The results showed 90 discharged cured, 70 out of 79 of whom were traced and were still well six or more months later; 11 died, all but one in very bad condition when admitted, including 7 with ascites; only 2 failed to respond to treatment, and 1 did not complete the course. A number of cases which had resisted former treatment were included, and he has now found that these do no worse on the average than untreated cases, so he doubts the occurrence of resistant cases due to insufficient treatment. The most reliable test of cure is continued good health for six months, as relapses nearly always occur within about three months of the cessation of the drug. Favourable signs are rapid fall of temperature and diminution in the size of the spleen, increase of the leucocytes to 8000 or more, and a gain of 7 or more pounds in weight. He thinks that a course of 10 grm. would cure 98 per cent of the cases, but advises an initial course of 3.5 grm., with an expected relapse rate of 9 per cent, which would be reduced to 2 per cent by a further course of 6 grm. and to 1 per cent if the second course is 10 grm.—a truly wonderful advance on the old mortality of about 90 per cent in pre-antimony days.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1927, Jan., 713; ²*Ibid.* 1926, Oct., 329; ³*Ibid.* July, 243; ⁴*Ibid.* 1927, Jan., 567; ⁵*Jour. Trop. Med. and Hyg.* 1926, Dec., 387; ⁶*Lancet*, 1926, ii, 1909; ⁷*Ind. Med. Gaz.* 1927, April, 199; ⁸*Ibid.* May, 353; ⁹*Ibid.* 1926, July, 324; ¹⁰*Ibid.* 1927, June, 325; ¹¹*Ibid.* July, 362; ¹²*Ibid.* Feb., 76; ¹³*Ind. Jour. Med. Research*, 1926, Oct., 263.

KERATITIS. (*See CORNEA, DISEASES OF.*)

KIDNEY, SURGERY OF.*Sir John Thomson-Walker, F.R.C.S.*

The diagnosis of *horseshoe kidney* has been made in a few cases by abdominal palpation, but usually the condition has been discovered at operation or post mortem. H. L. Kretschmer¹ describes five cases of horseshoe kidney in which the anomaly was recognized before operation. In some cases the renal outline as shown by simple X-ray examination is sufficient for diagnosis. Occasionally the presence of renal calculi in unusual situations will raise suspicion as to the kidney being of the variety in question. In three of the writer's cases pyelography led to an accurate diagnosis. Important points in the interpretation of the pyelogram are rotation of the pelvis with the calices pointing inwards towards the spine, or forwards with the whole pelvis somewhat nearer the middle line than is usual. A calix overlapping the shadow of the spinal column appears to be a very characteristic feature, especially if it is the lowest calix.

Large '*solitary*' cysts or '*serous*' cysts are occasionally met with in the kidney, and Andrew Fullerton² records such a case and reviews the literature. A rarer form of cyst is the '*simple hæmorrhagic*' cyst, which must be distinguished from the serous cyst and from hæmorrhagic cysts connected with renal growths. Judd and Simon³ found fifteen simple hæmorrhagic cysts in the literature. The etiology is obscure, but the suggestion that these cysts are the result of aneurysmal dilatation of arteries in the renal substance is the most acceptable one, and is the only one that is entirely consistent with the clinical and pathological findings. Such cysts are rare and their symptoms are not characteristic. A pre-operative diagnosis has not as yet been recorded, and even at operation it may be difficult to know that one is not dealing with a malignant growth. Treatment consists in resection of the cyst when this is feasible, and, if not, nephrectomy.

In the past the *recurrence of stone after operation* was in many cases due to calculi being overlooked either as the result of faulty methods of diagnosis or of operative technique. In spite of the almost complete elimination of these two factors as the result of modern methods of urological investigation and treatment, there remain a certain number of cases in which calculi are overlooked, and a larger number still in which calculi are formed again. D. N. Eisendrath¹ believes that the persistence of a chronic infection of the kidney after operation, with or without inflammatory dilatation and thickening of the renal pelvis, the presence of mechanical obstruction such as ureteral stricture, kinking due to abnormal mobility of the kidney or faulty insertion of the ureter into the renal pelvis, obstruction at the neck of the bladder, or urethral stricture, and, finally, the presence of muscular atony distal to the kidney, are potent causes of recurrence of calculus formation.

H. M. Conner and H. C. Bumpus, Jr.² discuss the possible *relationship of purpura hæmorrhagica* to '*essential hæmaturia*', in the hope that such a discussion may give rise to further investigation of these cases of hæmaturia from the point of view of any blood changes that may be present. Instances of hæmaturia are not unusual in cases of purpura of various forms and in cases of hæmophilia, and the writers have investigated 33 unselected cases of hæmaturia, in 22 of which the diagnosis of '*essential hæmaturia*' was made, and in all of which this diagnosis was provisional only. In the search for some factor in these cases which might point to an abnormality of the coagulation mechanism of the blood, particular attention was paid to the blood-platelet count, the coagulation time, and the bleeding time. The calcium-coagulation time and the prothrombin time were also estimated in nearly all cases, and the possibility of bleeding elsewhere was carefully investigated. If, besides a deficiency in some of the coagulation factors, there is a local predisposing cause

such as unusual vascularity of the mucous membrane or an area of localized infection, the possibility of bleeding is greatly increased. The fact that lavage of the renal pelvis with a styptic solution such as silver nitrate will frequently stop such bleeding would suggest such a localized cause. As the result of their investigation, the writers are of opinion that there is not enough evidence at hand to prove that 'essential hæmaturia' is always localized purpura hæmorrhagica, or is due to a deficiency of blood-platelets, but the evidence they have collected is rather suggestive that this is true in some cases.

In a full discussion of *ureteropyelography*, W. F. Braasch and B. H. Hager⁶ state that the most essential technical precaution necessary is to avoid over-distention of the renal pelvis. Interpretation of pyelograms should only be made in connection with all available cystoscopic and clinical data. Variations in outline of the normal pelvis, variations in the size and outline of the normal major and minor calices, incomplete filling of the pelvis and calices, undue spasticity of the pelvis, and the presence of blood-clot in the pelvis and calices are frequent sources of error in interpretation. Post-operative deformity must be borne in mind in some cases. The normal ureterogram is subject to greater variation in appearance than is the normal pyelogram; therefore a negative ureterogram is of greater significance in the exclusion of ureteral lesions than is a ureterogram with physiological deformities which may be misconstrued. The general rule that no instrumentation should be employed in the urinary tract which is not necessary to complete the diagnosis should be strictly observed, and, in spite of an ideal medium and every technical precaution, ureteropyelography should not be carried out as a routine investigation.

The irregularity of growth of renal tumours renders the interpretation of pyelograms obtained in such cases difficult. In many cases, however, M. F. Campbell⁷ states that certain more or less definite changes will be made out as a result of (a) mechanical distortion of the pelvis and calices by pressure or torsion, (b) obstruction to the outflow of urine owing to involvement of the upper portion of the ureter, and (c) ulceration due to infection and sloughing of necrosed tissue. Actual displacement of the kidney and ureter or mere rotation on a vertical or transverse axis may be of great diagnostic importance. D. N. Eisendrath and I. S. Koll⁸ have also reviewed the characteristic changes seen in pyelograms in such cases, and point to difficulties in diagnosis caused by chronic perinephritis and by atrophic pyelonephritis.

A solution containing approximately 40 per cent of iodine in chemical combination with a vegetable oil (lipiodol iodipin) has been found to be almost entirely without toxicity when used for intratracheal and intrathecal injections. Neuswanger⁹ has used such an iodized oil as a pyelographic medium in a series of 27 patients and obtained very satisfactory shadows. [The viscosity of the oil, which necessitates considerable force in introducing it through a fine syringe or catheter and causes difficulty in expelling it afterwards, is a serious disadvantage in the use of this medium.—J. T.-W.]

The *ureter in early childhood*, according to C. G. Mixer,¹⁰ is more tortuous than in adult life, and ureteral kinks near the uretero-pelvic junction are common. With modern instruments, all methods of investigation of the urinary tract are available in children, and the writer emphasizes the importance of employing them at this age where urinary obstruction or pyuria exists.

C. A. R. Nitch¹¹ insists on the thorough clinical and bacteriological examination in all cases of *intermittent bladder irritation* and so-called cystitis, for on this depends the early diagnosis of urinary tuberculosis. Where bladder symptoms persist after nephrectomy for renal tuberculosis, he has found that surgical diathermy per urethram offers the best means of relieving the patient. The instillation into the bladder of a 20 per cent preparation of gomenol oil,

or of a solution made up of 1 part of iodoform and 5 parts of guaiacol in 100 parts of sterile olive oil, is also of value in this respect.

A. L. Wolbarst¹² states that pyelography is seldom called for in cases of *renal tuberculosis*, the diagnosis of which rests mainly on the discovery of tubercle bacilli in the urine obtained by ureteral catheterization, the results of guinea-pig inoculations, and the estimate of the renal function of the two kidneys. In such cases the interests of the patient are best served by reducing instrumentation to the minimum compatible with making a complete diagnosis. W. M. Spitzer and W. W. Williams¹³ have carried out a series of experiments on guinea-pigs from which they conclude that "the tubercle bacillus does not pass through normal renal epithelium" and that "the tubercle bacillus appears in the urine only when tuberculous lesions exist either in the urinary tract or in the genital tract". The experiments consisted in injecting guinea-pigs with the urine of phthisical patients which was free from chemical or pathological elements. As the guinea-pigs did not die of tuberculosis, it was concluded that tuberculous bacilluria did not exist without a renal lesion. [These experiments are not convincing.—J. T.-W.]

H. P. W. White¹⁴ records five cases of 'closed renal tuberculosis', and from consideration of cases recorded in the literature concludes that this condition occurs in at least 10 per cent of cases of renal tuberculosis coming to operation and 18 per cent of cases submitted to post-mortem examination. The disease may go through all its stages without any urinary symptoms and may only be detected as a result of some complication supervening. Nephrectomy is the treatment of choice, and the prognosis following this procedure is good. Discussing the diagnosis of renal tuberculosis, W. E. Stevens¹⁵ states that the absence of tubercle bacilli from the urine in the presence of renal involvement is not uncommon in the early stage of the closed parenchymatous type of infection before extension to the pelvis of the kidney has occurred, while the later failure to demonstrate the bacillus is more often due to occlusion of a tuberculous ureter. In addition, there are also intervals during which, even though the ureter is patent and the process involves the renal pelvis, the urine contains no tubercle bacilli. "The presence of tubercle bacilli in smears of the bladder or kidney urine or a positive guinea-pig test does not necessarily indicate renal involvement, as tubercle bacilli may occasionally be excreted by a normal kidney". The guinea-pig test is not infallible. It is sometimes negative when the smears have been positive, for some strains of tubercle bacilli may be pathogenic for man but not for the guinea-pig. As regards the value of indigo-carmine injections, the writer has seen early cases in which not only has the excretion of dye not been delayed on the diseased side, but its appearance on this side has occurred slightly before that on the opposite side.

Non-tuberculous infections of the kidney are arranged by H. Cabot¹⁶ in two main groups, viz., cortical infection of the renal parenchyma, and pyelonephritis, on the understanding that in certain cases these may 'overlap' and that 'mixtures' may occur. Cortical infections are commonly due to staphylococci or streptococci, most commonly the *Sta. aureus*. They are relatively uncommon in childhood, are ordinarily seen in adult life, and rarely in late adult life. The infection is practically always blood-borne, and is commonly associated with lesions on the surface of the body, usually of the carbuncle type, or with sore throat of staphylococcal rather than streptococcal origin. It may also be associated with acute osteomyelitis. The superficial lesion may have nearly or even completely healed before the renal infection has so developed as to be evident; hence the importance of going carefully into the history. The characteristic lesion is the subcortical abscess. In more acute cases the cortex may be studded with small abscesses, and in the most severe

stage there is a massive breaking down of the renal parenchyma which may go on to complete necrosis of the organ. Such cortical abscesses are the common precursors of the true perinephric abscess. The type of infection of most importance is that in which the onset is insidious, which develops slowly, and in which the diagnosis may be obscure for a long time.

P. W. Aschner¹⁷ discusses 61 cases of *staphylococcal infection of the renal parenchyma*. In 34 cases there was a definite focus of infection, in the form of furuncles, carbuncles, infected fingers, infected wounds, otitis media, or prostatic abscess. In less acute cases a cortical abscess or 'carbuncle of the kidney' develops, associated with chronic sclerosing perinephritis. In rare cases a diffuse suppurative nephritis occurs. The writer classified his cases as follows: perinephric abscess, 36; cortical abscess and 'carbuncle', 23; suppurative nephritis (multiple abscesses), 4. In 2 of the cases the disease was bilateral. In the acute cases, perinephric suppuration develops early and the diagnosis is relatively easy. In the subacute and chronic cases, clinical signs are variable and may simulate various types of thoracic, abdominal, and spinal disease. The absence of striking urinary symptoms, the slight or absent urinary changes, and the indefinite findings on cystoscopic examination make the diagnosis of cortical abscess or 'carbuncle of the kidney' difficult. Some of these infections resolve without frank suppuration. The prognosis is not so good in children and elderly patients as in young adults, especially in the presence of other metastatic lesions or complications involving the venous circulation. Nephrectomy is only called for in a few cases, such as those with widespread involvement of the renal parenchyma and persistent 'bacteremia'.

W. F. Braasch and E. P. Cathcart¹⁸ report the results of a continuous study of 251 patients suffering from *chronic pyelonephritis*, observed over periods varying from 10 to 15 years. The findings on cystoscopic examination and X-ray examination are discussed, and the writers state that the deformity of the outline of the renal pelvis and ureter as shown by ureteropyelography is usually typical. There is marked irregular dilatation of the ureter, usually throughout its length, with slight if any dilatation of the pelvis, and usually no dilatation of the calices. The renal function, as a rule, remains normal even after many years of infection. If it is reduced, this is usually the result of a very long-standing infection or the sequel of some acute complication. Owing to the ureteral dilatation, excretion of dye may be delayed and give an erroneous impression, and in the routine examination of these cases the writers rely largely on blood-urea estimations. The clinical symptoms caused by renal insufficiency following on chronic pyelonephritis are those that usually accompany interstitial nephritis.

Calculus formation, according to E. B. Fuller,¹⁹ is dependent upon infection and stasis, the result of post-infective kink or stricture. In treatment, therefore, these factors must be considered and dealt with. He recommends that after healing of the operation wound, pelvis lavage and dilatation of the ureter should be continued at weekly intervals for a few weeks and the patient kept under observation for a year.

E. Beer²⁰ reports six cases in which a *diagnosis of renal calculus* composed of uric acid was made by the demonstration of a filling defect in the pyelogram of the diseased kidney and confirmed by obtaining 'scratch-markings' on a wax-tipped whalebone bougie passed up to the renal pelvis. He found that about 10 per cent of 136 cases of renal calculus seen at the Mount Sinai Hospital, New York, during the past four years were chiefly composed of uric acid. Attempts to render such stones more opaque by coating them with pyelographic media are of little value. "The most valuable objective diagnostic criteria are a diminished output of indigo-carmin, a positive

scratch mark, and a defect in the pyelographic filling of the pelvis on the side of the stone".

Discussing the *treatment of urinary calculus*, Thomson-Walker²¹ states that operative treatment is contra-indicated in cases with large bilateral renal stones, for in such the destruction of renal tissue is very considerable, and what is left may be little more than is sufficient to carry on the renal function. Operation for the removal of a large branched calculus entails extensive destruction of renal tissue, and it is practically certain that within a few months, or at most a year or two, stones will have re-formed. Operation in such cases is only performed where there is severe pain, septic absorption, or obstruction leading to hydronephrosis or pyonephrosis, all of which are rare in this type of calculus. When one kidney contains a large mass of stones and the other is the seat of a small calculus, the small stone should be removed without delay owing to the danger of its becoming impacted in the ureter and causing anuria. The extensively diseased kidney is best left alone if it is giving rise to no symptoms. When the calculi in each kidney are of moderate size and are too large to pass down the ureter, they should be removed by operation. A cutting operation is rarely required for small stones about the size of a pea or even larger, for these are discharged by natural means assisted by diuresis and dilatation of the ureter by bougies. At the present time, when early diagnosis by means of the X rays is the rule, these comprise about 80 per cent of the cases of stone in the kidney and ureter.

Investigation of the *anatomy of the renal blood-vessels* leads Fuchs²² to consider that a stone in a calix is best approached, not by an incision on the convexity of the organ, but by a radial incision made on the anterior or posterior surface, owing to the disposition and mode of branching of the interlobular arteries. The disposition of the veins is regarded as of importance in respect to the hæmorrhage which occurs in cases of renal tumour and the location of the source of bleeding in so-called 'essential' hæmaturia, in that the fornix calicis is surrounded for three-quarters of its circumference by a network of veins of the calibre of the interlobular veins which lies directly on the wall of the calix without any interposed sinus fat. Hæmorrhages, therefore, from these veins enter not the fatty tissue of the sinus but the calix. The writer considers that this finding explains also why fluids injected into the renal pelvis may, not infrequently, enter the venous system.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1927, Jan. 8, 77; ²*Brit. Jour. Surg.* 1927, April, 629. ³*Surg. Gynecol. and Obst.* 1927, May, 661; ⁴*Ibid.* March, 317; ⁵*Amer. Jour. Med. Sci.* 1927, Feb., 176; ⁶*Surg. Gynecol. and Obst.* 1927, April, 433; ⁷*Med. Jour. and Record*, 1926, Oct. 20, 481; ⁸*Jour. Amer. Med. Assoc.* 1926, Nov. 13, 1640; ⁹*Surg. Gynecol. and Obst.* 1926, Aug., 169; ¹⁰*Ann. of Surg.* 1926, Oct., 533; ¹¹*Brit. Med. Jour.* 1927, I, 803; ¹²*Med. Jour. and Record*, 1927, Jan. 19, 112; ¹³*Jour. Amer. Med. Assoc.* 1927, June 11, 1870; ¹⁴*Lancet*, 1926, II, 1301; ¹⁵*Jour. Amer. Med. Assoc.* 1927, Jan. 8, 71; ¹⁶*Lancet*, 1926, II, 53; ¹⁷*Amer. Jour. Med. Sci.* 1926, July, 63; ¹⁸*Jour. Amer. Med. Assoc.* 1927, May 21, 1630; ¹⁹*S. Afric. Med. Record*, 1926, Nov. 13, 473; ²⁰*Surg. Gynecol. and Obst.* 1926, Oct., 436; ²¹*Lancet*, 1926, II, 193; ²²*Zeits. f. urolog. Chir.* 1925, xviii, 164.

LABOUR. (See also CONTRACTED PELVIS.)

Beckwith Whitehouse, M.S., F.R.C.S.

Obstetric Forceps.—Cecil Coghlan,¹ in a paper on forceps, draws attention to the latest type of instrument introduced by Kielland, of Oslo, and points out the advantages which it possesses over the Milne Murray and Neville-Barnes modifications of the axis-traction forceps in common use to-day in the British Empire. In the classical type, both the locking apparatus and the pelvic curve introduce certain disadvantages. The lock makes the instrument rigid, preventing any sliding of the blades the one upon the other. The pelvic curve, on the other hand, necessitates the application of the instrument with the

blades more or less on the lateral wall of the pelvis, and therefore their proper application to the fetal head is often impossible. As a result there is with the older types of forceps a greater tendency to slip and a greater risk of damage to the child. A further disadvantage in high applications is the shape of the shanks, which lie apart and do not meet until they join the handles at the lock. If therefore the forceps is applied symmetrically to the head at the superior strait, the posterior blade bridges over the anterior concavity of the sacrum and prevents the head from entering the pelvic cavity.

The *Kielland forceps* differs from the classical type in the following respects: The pelvic curve is almost entirely absent, the blades occupying a plane below that of the handles and shanks just as a bayonet is related to a gun. The shanks themselves are long, straight, and flat, the handles being attached to the lateral sides of the shanks, and permitting a free sliding movement of the branches. The lock is a simple affair, consisting of an L-piece attached to one branch forming a deep groove in which the other branch slides. There is no fixing screw, and the whole instrument is very lightly constructed. The blades or branches are not described as right or left, anterior or posterior, for in the application of the instrument the pelvis is disregarded entirely and only the position of the fetal head considered. The blades are always applied in the occipito-frontal diameter in vertex cases and in the mento-occipital diameter in face presentations. Application is made with the patient in the dorsal position. Force is never necessary, and when the branches of the forceps have

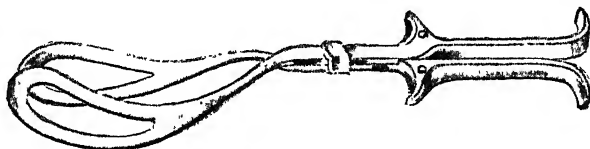


Fig. 66.—The Kielland obstetric forceps.

been articulated the blades should lie symmetrically with the handles in the mid-line on the perineum. Traction is applied always in the direction—and only in the direction—in which the handles point. (Fig. 66.)

The advantages which the Kielland type offer over other forceps are set out by Coghlan as follows: (1) It can be applied symmetrically to the fetal head in practically all positions, a distinct improvement especially when the head is lying in a transverse or oblique position. (2) It can even be applied to the asynclitic head in parietal presentations owing to its ability to be locked with the blades at different levels. (3) Rotation of the head is facilitated and is safe. Also in unrotated occipito-posterior positions flexion of the head is promoted owing to the application of the instrument in the occipito-frontal diameter. (4) Owing to its broad even grip there is no damage to the fetal head. Also, owing to the fact that it rotates within and does not drag the soft parts with it, it does not injure the maternal tissues. (5) It does not slip when once applied, unless the handles are pulled forwards. (6) It is of great advantage in face presentations, not only when the chin is anterior but also when it is posterior.

Kielland forceps can be used for low application, but the instrument possesses here no advantage over the ordinary type.

R. Broom,² discussing the use of forceps from the point of view of the general practitioner, emphasizes the importance of the application of the instrument in relation to the fetal head and not to the pelvis. He strongly

criticizes all the obstetric forceps in common use, and issues a plea for a more extended trial of a solid axis-traction forceps invented by W. L. Reid, of Glasgow, forty-five years ago.

REFERENCES.—¹*Med. Jour. of Australia*, 1926, July, 143; ²*S. Afric. Med. Record*, 1926, July, 290.

LARYNX, DISEASES OF.

A. J. M. Wright, M.B., F.R.C.S.

Fibroma.—This, the most common benign growth of the larynx, usually described as a fibroma, is dealt with under the title of 'laryngeal varix' by Charles Imperatori.¹ The pathology has always been obscure. These growths have been variously termed fibroma, angiofibroma, varix, and angioma. The tumour is usually located in the anterior third of the larynx with a sessile attachment to the under surface of the cord (*Fig. 67*). The only symptom produced is, as a rule, hoarseness, which may vary from moment to moment owing to the change in position of the growth. They may be either pale or darkish red in appearance, depending on the amount of vascularity. Histologically, although there is considerable variation in the appearances met with, typically, dilated venules are present with a surrounding matrix of cedematous connective tissue, the whole enclosed in squamous epithelium. A summary of the fourteen cases on which the article is based shows that the condition is found more frequently in the male than in the female, that the age of incidence ranges from 21 to 55, and that, in the majority of cases, hoarseness has been present for a few months. In nearly all cases, abuse of the voice seems to be a factor in causation, and, in many, the symptoms date definitely from one particular occasion in which the voice was over-used. Their site of attachment to the anterior portion of the vocal cords, on which probably the strain is greatest, would support this view of their causation. Exactly how this takes place is uncertain, but presumably the trauma produces at first a localized swelling either cedematous or hæmorrhagic. Treatment consists in removal through the natural passages, with subsequent voice rest.



Fig. 67.—Typical varix of the larynx. (Re-drawn from the '*Medical Journal and Record*'.)

Tubercle.—C. D. Parfitt,² in a general review of the question of the treatment of laryngeal tuberculosis in sanatoria, finds that, in the majority, neither the routine examination of the larynx nor its treatment when involved received due attention. As to treatment employed, silence, sprays, and insufflations were used in all. In addition, of the 20 sanatoria from which details were received, intratracheal injections were used in 6, pigments in 11, chaulmoogra oil in 2, natural heliotherapy in 12, artificial heliotherapy in 2, tuberculin in 5, nerve-blocking in 7, galvanocautery in 2, removal of the epiglottis in 4, and other operations in 3. Parfitt was so situated that, while not being a laryngologist, he himself had to undertake the treatment of laryngeal cases, and, during the last fourteen years, has found **Voice Rest**, aided in some cases by the **Galvanocautery**, to be the most efficient line of treatment. (Details of its use were given in the *MEDICAL ANNUAL* for 1927, p. 258.) For palliative treatment, he advises **Orthoform** with the auto-insufflator, and for intratracheal injections, Seymour Jones' apparatus (*see MEDICAL ANNUAL*, 1923, p. 258). **Nerve Blocking**, sometimes with **Removal of the Epiglottis**, is also useful.

Artificial Pneumothorax.—StClair Thomson and Richard R. Trail,³ from Midhurst Sanatorium, have reviewed the bearing of artificial pneumothorax treatment on laryngeal lesions. They have pointed out that the presence of a laryngeal lesion renders the prognosis more gloomy, 75 per cent of such cases being dead within five years. This laryngeal complication makes the outlook still worse if it develops while under sanatorium treatment or after the induction of an artificial pneumothorax. On the other hand, the presence of tuberculosis in the larynx is no contra-indication to the induction of a pneumothorax, which may, on the contrary, either speedily affect a cure or render the larynx more amenable to treatment by other methods, i.e., voice rest and the galvanocautery. The larynx may be cured by an artificial pneumothorax even though bacilli continue to be present in the sputum. The indications for its use must, primarily, be based on the condition of the lungs and on the general condition of the patient, the only contra-indication as far as the larynx is concerned being an acute miliary invasion. Illustrative cases are given; *Plate XXIII* demonstrates some of the results obtained.

Julius Dworetzky,⁴ from a study of 500 cases of pulmonary tuberculosis, finds that although a quarter of the cases had laryngeal complications, in none in which an artificial pneumothorax had been induced did the larynx subsequently become involved. He also found that where laryngeal disease already existed, improvement was usually marked, infiltrations being absorbed and ulcerations healing. His own figures are supported by 1500 other cases which had been treated by this method, only 4 of which subsequently developed tuberculous laryngitis. Of 32 cases showing laryngeal lesions and treated by an artificial pneumothorax, 26 either healed or showed decided improvement. Thus, in the artificial pneumothorax we seem to have not only a treatment which, in suitable cases, will produce great improvement in the lung condition, but also one which is of great assistance as regards the larynx.

Blocking of Superior and Recurrent Laryngeal Nerves.—The treatment of the dysphagia of advanced laryngeal tuberculosis by Alcoholic Injections into, or section of, the superior laryngeal nerve, was dealt with in the *MEDICAL ANNUAL*, 1924, p. 256. L. E. Bassenko⁵ considers that alcoholic injections are not always sufficient, and reviews 27 cases in which the nerve was divided, in 10 of these on both sides. He found that the operation was effective in removing or reducing the pain in swallowing, but, when bilateral, was not free from risk. H. P. Schugt⁶ also states that section of the superior laryngeal nerve is a safe method of permanently removing the pain on swallowing. He finds that the results of alcoholic injections are too uncertain. Division of the superior laryngeal nerve, however, does not produce any favourable change in the lesions, and he has therefore employed alcoholic injections into the recurrent laryngeal nerve, in the hope that the immobility produced may favourably affect the disease. The paralysis should only be induced on one side, and lasts for from four to eight weeks. Of 15 cases in which therapeutic paralysis was induced, improvement took place in 9. The method would seem to be most favourably employed in cases of unilateral disease, and to be preferable to a division of the recurrent laryngeal nerve as first suggested by Leichenring. The technique of the injection is simple. A needle 6 to 8 cm. in length is pushed along the first tracheal ring to the vertebral column, then withdrawn about 1 cm., and 1 c.c. of 80 per cent alcohol injected.

REFERENCES.—¹*Med. Jour. and Record*, 1927, March 2, 323; ²*Canad. Med. Assoc. Jour.* 1926, Oct., 1206; ³*Lancet*, 1, 963; ⁴*Ann. of Otol. Rhinol. and Laryngol.* 1926, March, 42; ⁵*Vopr. Tuberk.* 1925, No. 3, 28; ⁶*Arch. Otolaryngol.* 1926, No. 4, 479.

LATE RICKETS. (See RICKETS, LATE.)

PLATE XXIII

ARTIFICIAL PNEUMOTHORAX IN LARYNGEAL LESIONS

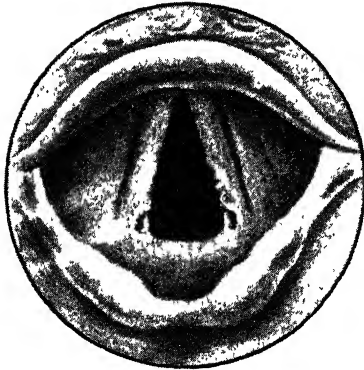


Fig. A.—View of the larynx, showing abraded and ulcerated cord.

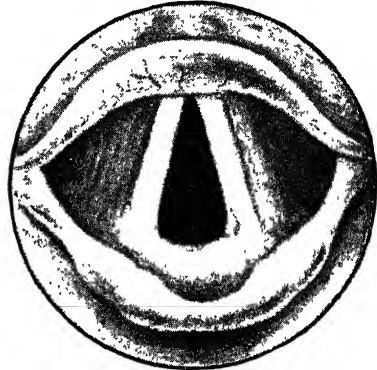


Fig. B.—The same larynx as in *Fig. A*, quite cicatrized three months after artificial pneumothorax. Note the scar over the left vocal process.

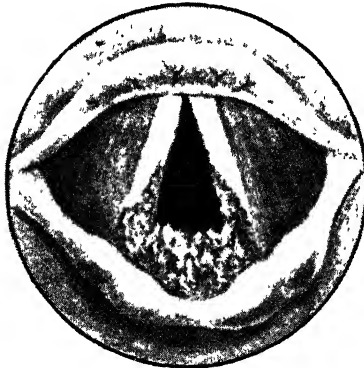


Fig. C.—Extensive disease of larynx.

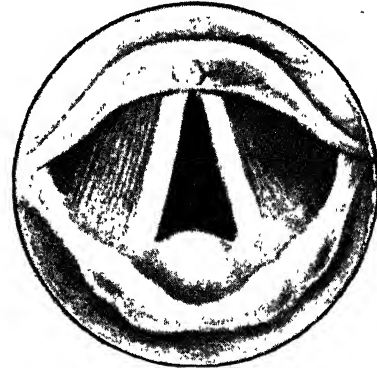


Fig. D.—The same larynx as in *Fig. C*, subsequent to artificial pneumothorax.

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LEGAL DECISIONS, RECENT (on Medico-legal or Public Health Questions).*Joseph Priestley, B.A., M.D., D.P.H.***COMPENSATION FOR WORKPEOPLE—WORKMEN'S COMPENSATION ACTS.**

1. *Miners' Nystagmus*.—This disease is prone to recur, and the fact that no nystagmus symptoms are found on a special examination made by a medical practitioner on a specified date must not be interpreted as meaning that a particular person is quite recovered from such disease. This was a County Court decision, which has been upheld both by the Court of Appeal and by the House of Lords.

2. *Lead Poisoning*.—This is 'an accident' under the Workmen's Compensation Acts, and power is given to employers to exact contributions from previous employers (the *final* employer, naturally, also being liable), but on condition that the workman concerned, 'at or immediately before the date of the disablement or suspension', was so employed in one of the specified processes. What interval is allowable between the employment and the disablement or suspension? The Court of Appeal has only given decisions on specific cases, and a general principle has not yet been laid down as 'case-law'. An appeal case to the House of Lords, or a small amending (or explanatory) Act of Parliament, will be the next move if the question is to be, legally, finally settled.

3. *Mule-spinner's Face Cancer*.—This is a disease that may be due to irritation (constant or often repeated) of mineral oil on the face of a mule-spinner, but the disease *may* arise from some other cause and even naturally. Such a doubt cannot be entertained where a medical certificate states definitely that the cancer is due to mineral oil in mule-spinning.

MEDICAL PRACTITIONERS AND LUNACY CERTIFICATES.

Harnett v. Fisher (House of Lords): judgement given. Limitation Act 1623, Lunacy Act 1890, and the Public Authorities Protection Act 1893.

The House of Lords, on May 27, 1927, dismissed the appeal of Mr. W. S. Harnett against the verdict and judgement entered for the defendant, Dr. Holdrich Fisher (medical practitioner), in the King's Bench Division before Mr. Justice Horridge and a special jury, for damages for alleged negligence in certifying Mr. Harnett as a proper person to be detained under care and treatment under the Lunacy Act, 1890—the special jury having found: (1) That Mr. W. S. Harnett was not insane at the time when the certificate was issued (Nov. 10, 1912); (2) That Dr. H. Fisher did not act with reasonable care; and (3) That £500 damages should be awarded. Though the certificate was issued on Nov. 10, 1912, the writ in the action was not issued until May 31, 1922, with the result that 'statute limitations' (six years) was claimed as barring action at law, either under Section 331 of the Lunacy Act 1890, or under the Public Authorities Protection Act 1893, by which latter that section of the Lunacy Act 1890 had been repealed, since the writ was issued. It was held, however, that the 'statute limitations' was applicable not under the 1890 or the 1893 Act but under the Limitation Act 1623, known as the Statute of James. The appeal to the House of Lords was, therefore, dismissed, as had previously been the appeal to the Appeal Court, consisting of the Master of the Rolls, Warrington and Scrutton (Lord Justices), from the judgement given by Mr. Justice Horridge—a judgement that was entered for Dr. Fisher, although the jury had found a verdict for Mr. Harnett.

So ends this celebrated and prolonged case. Whilst 'points of law' have in the end saved the medical practitioner concerned, the jury's verdict was very definitely adverse, and, had such verdict been upheld, the medical practitioner

concerned would have been ruined financially and professionally. As it is, there is still the worry and financial loss to the medical practitioner to be taken into account. Certification in lunacy cases calls for serious consideration and revision. It would seem that an easy way out of the difficulty would be to arrange for the Court, after investigation and inquiry, to take the responsibility and be, consequently, and subsequently, legally liable for any lunacy certificates that are issued. Without such an amendment, or some other equally efficient amendment, the time will come when medical practitioners will 'strike' against signing lunacy certificates, and then where shall we be? Trial by jury certainly seems to be unsatisfactory in such cases, which might with greater advantage be left to the judges with the help of medical expert lunacy advisers (as assessors) to deal with the strictly medical points raised in connection with the issuing of lunacy certificates, which, after all, merely express the personal individual opinion of the particular certifying medical practitioner, to the best of his or her knowledge and belief. Negligence is another matter altogether.

RAGS AND RAG FLOCK.

Rag Flock Act 1911 and the 1922 Regulations thereunder: Extension of the Definition of Rags.—A further 'case-law' is to be noted, under which it has been held in the High Court that the word 'rags' includes flock made from new and uncontaminated material, and is not limited to rags which have become polluted through association with human or animal life. The case is *Balmforth v. Chadburn and Another*, and the judgement follows the previous decision of the judge in the case of *Cowper v. Smith* (1914). The standard as to cleanliness set up is soluble chlorine in amount in the form of chlorides, after thorough washing with distilled water at a temperature not exceeding 25° C., from not less than 40 grm. of a well-mixed sample of flock, *not exceeding 30 parts of chlorine in 100,000 parts of the flock.*

VARIOUS TONIC WINES PATENT MEDICINES.

Sale of Food and Drugs (Adulteration) Acts, etc.

1. *Meat and Malt Wine.*—No official standard of quality has been fixed, but it has been held by the King's Bench Division that, in such a case, the magistrate must make his own standard (or *average* minimum requirement as generally fixed in the trade).

2. *'Wincarnis with Quinine'* is both an intoxicating liquor and a patent medicine in the opinion of the High Court, and, consequently, both a justice's licence for retailing intoxicating liquor and also an excise licence for patent medicines are necessary. This decision is important from a medical standpoint.

REGISTRATION OF MILK SELLERS OR PURVEYORS.

Dairies, Cowsheds, and Milk-shops Order 1885, article 6 (1)—Milk and Dairies (Consolidation) Act 1915, s. 19.

Burrows v. Rapson (Appeal Court).

In December, 1925, at the Marylebone Police Court, the Magistrate decided that it was not compulsory for shopkeepers who sold sterilized milk in the same properly closed and unopened receptacles in which it was delivered to them to register as milk sellers or purveyors, and the Magistrate also expressed doubt as to whether or not sterilized milk was 'milk' within the meaning of the Dairies, Cowsheds, and Milkshops Order 1885, his own opinion being that it was not. The Kensington Borough Council took proceedings against two vendors of sterilized milk in bottles (opened and unopened) for selling the

same without being licensed to do so as milk sellers or purveyors, and a conviction followed in each case. On appeal, the Kensington Magistrate's decisions were upheld and the particular appeal was dismissed, accordingly, with costs.

It is clear that, whilst a shop from which milk is not supplied otherwise than in the properly closed and unopened receptacles in which it is delivered to the shop is not a dairy within the meaning of Section 19 of the Milk and Dairies (Consolidation) Act 1915, the person who sells that milk in the unopened receptacles is a purveyor of milk, who is required to register with the local authority before he is entitled to sell such bottled milk.

RIGHT TO PARTLY SUBLET UNDER THE RENT RESTRICTIONS ACTS.

Rent Restriction Acts, 1920, 1923.

This thorny and involved subject has advanced one stage farther in the Courts. A divisional King's Bench Court, upholding a County Court Judge's decision, decided that no such legal right to partly sublet was possessed by the 'statutory' tenant under the Rent Restrictions Acts. The Appeal Court (Lords Justices Scrutton and Sargant and Mr. Justice Eve) thought otherwise, and decided (on Jan. 30, 1928) accordingly. It now remains for the House of Lords tribunal to make definite 'case-law' on the subject, if the expenses of such a decision can be met by one or other of the litigants. These expenses must be enormous. The importance of a decision goes without saying, as thousands, if not millions, of persons are involved, or may be so. The present *impasse* certainly points to there being something wrong in the drafting of the Rent Restrictions Acts, unless it is agreed that such drafting is to be on such lines as to make work for the legal profession in the future, in the way of explaining, etc. Such a suggestion is unthinkable, but facts must be dealt with as they are found to exist. No one can say that the drafting of the Rent Restrictions Acts leaves nothing to be desired! Indeed, from a practical point of view, the contrary has been proved, at least in the opinion of the Appeal Court, as expressed in Lord Justice Scrutton's summing up and decision.

LEISHMANIASIS. (*See KALA-AZAR; ORIENTAL SORE.*)

LEPROSY.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

PROPHYLAXIS.—E. H. Molesworth¹ suggests the abandonment by Australia of compulsory segregation, and he is supported in his view by a leading article in the *Australian Medical Journal*.² He holds that Europeans have a greater resisting power than natives against the disease, and he thinks the danger of infection in such a dry climate as Australia is not sufficient to justify compulsory isolation even of bacteriologically positive cases, while it prevents the early cases coming forward for treatment. Further, he is not satisfied that the best treatments are being supplied in the New South Wales Lazaret, the oral use of chaulmoogra oil being mainly relied on, while at the Peel Island Settlement there is no resident medical officer. C. Cook,³ in a reply to Molesworth, disputes the contention that the British have a relative racial immunity, and he points out that six white lepers have been found in the last few years among a white population of one thousand in Queensland with a total leprosy rate of not under 1 per mille. He attributes the decline in New South Wales to segregation, which has not been efficiently carried out in Queensland, where a properly equipped colony with efficient treatment is required. G. R. Hamilton⁴ reports the case of a white attendant at a lazaret, where he was in close association with the lepers, who manifested the first

signs of leprosy close to a cut on his left hand made thirteen years before when working at the lazaret, and who had not been exposed to infection elsewhere. Boine,⁵ who discusses prophylaxis in France, is in favour of compulsory measures on the lines of the Norway system.

PATHOLOGY.—M. Leger⁶ deals with the laboratory diagnosis of leprosy, and advocates microscopical examinations of scrapings from both nostrils, puncture of glands, and cutting out small pieces of skin from the lesions. He also advises humane methods of isolation and treatment, and the multiplication of dispensaries for cutaneous diseases, where early cases can be treated assiduously, especially with chaulmoogra-oil preparations. R. B. Lloyd, E. Muir, and G. C. Mitra⁷ record further experience on the Wassermann reaction, and conclude that mild nerve types show no more positive reactions (15 per cent) than the average syphilis-rate in Calcutta, but the more advanced skin types show as much as 50 per cent positive with ordinary Wassermann technique; at least three-fourths of them are due to syphilis, as shown by the effect of antisyphilitic treatment, and this complication predisposes to severe leprous lesions; the remainder, however, retain their reactions in spite of antisyphilitic treatment, so in these, leprosy may produce blood changes apparently similar to those in syphilis. They found that Hg. 33 (Avenyl) is very valuable in the treatment of syphilitic infections in lepers. The Khan test is best for use in leprosy clinics, and antisyphilitic treatment greatly benefits the accompanying leprosy, but antileprotic treatment does not affect a positive Wassermann in lepers.

TREATMENT.—An instructive discussion at the Royal Society of Medicine⁸ on the treatment of leprosy at a joint meeting of the Dermatological, Therapeutical, and Tropical Diseases Sections was opened by J. M. H. MacLeod, who recorded his experience of treatment at the St. Giles' Home for Lepers in Essex, and showed tables of a number of illustrative cases, nearly all long standing ones, who had been treated by various methods for long periods before drifting to this country, and he had seen no lasting effects from the treatment by Chaulmoogra Oil or other methods. As Rogers pointed out in the debate, these constituted for the most part the residual resistant cases in which treatment had failed before they came home, and were thus very unfavourable material for testing treatment, as compared with fresh and earlier cases seen in large numbers in the endemic areas of the disease. J. H. Sequeira related one case responding well to Protein Shock treatment. T. A. Henry, of the Wellcome Chemical Research Laboratories, attributed the good results in leprosy of the recent methods of injecting soluble preparations of chaulmoogra oil to the chaulmoogric and hydnocarpic acids they contained. He mentioned the use of certain metals, and spoke of Hg 33, or Avenyl, he had prepared, and which Muir has found of great value in leprosy complicated by syphilis.

E. Muir, of the Tropical Diseases Section, dealt with his experience of some thousands of cases during a number of years as whole-time leprosy research worker in the Calcutta School of Tropical Medicine, and stated that, although there is no specific cure for leprosy, "there is a line of treatment which will cause the permanent disappearance of all active signs of the disease in early cases, so that the patient is for all practical purposes *cured* [his italics], though, if a marked reduction in his general health occurs later, there is always the possibility of a relapse". The disease is more curable than tuberculosis, and it can always be diagnosed clinically before becoming bacteriologically positive. His present routine treatment is by Hydnocarpus Wightiana Oil with 4 per cent Creosote in doses gradually increased from 4 to 10 c.c. intramuscularly or subcutaneously, and, when the full dose ceases to produce focal or local reactions, 1 per cent Sodium Hydnocarpate is given intravenously in

doses rising from 2 to 10 c.c. according to Rogers' method, an alternation of the two methods being best. Considerable experience in the endemic areas is necessary for success. Severe nerve pain can be controlled by 1-1000 **Adrenalin Chloride** 2 to 4 min. intramuscularly. A table showed 64 cases remaining well for 1 to 5 years, and 36 of them for 3 to 5 years, and four or five times as many recovered cases could not be followed up. Nearly all early cases clear up, and very promising results have been obtained in many advanced ones, with clearing up lasting for several years. The treatment at clinics in Calcutta and many other places in India is cutting off to a large extent the bacillary reservoirs of the disease. He concludes: "I think we already have in our hands a line of treatment which will aid the rapid disappearance of leprosy from India and from the world, though delay is inevitable, due to the ignorance and backwardness of certain classes of the community". The paper was illustrated by sixteen striking photographs before and after treatment.

H. W. Wade and C. R. Lara⁹ dealt with the results in nearly 6000 advanced cases at Culion and in nearly 3000 at Manila, many of them earlier ones. They gave the data under the injection of **Ethyl Ester Chaulmoogrates**, with 629 negative cases at Culion in cases averaging eight years in duration, or 10.5 per cent, a number which would be increased to 800 by the end of 1926, and they estimated the recoveries or 'apparently cured' in this class at between 15 and 20 per cent. In the earlier Manila and Cebu detention camp cases the results were much better, the total cleared up numbering about 1000. They concluded that "the modern treatment methods are decidedly superior to the older ones, and seem to be particularly effective in the early cases. Though they are admittedly much less effective in well-established advanced cases, the results obtained in the Philippines during the last few years show a not inconsiderable proportion of such cases (probably 15 to 20 per cent) can be 'apparently cured' if treated intensively under proper conditions. In leprosy, as in cancer, emphasis must be laid on getting the patient early. It is from this point of view that treatment is now revolutionizing anti-leprosy campaigns". A third paper, by Isabel Kerr, recorded 17 and 19 per cent in two series of cases, amounting to several hundred in all, as having become quite negative after treatment at Dichpali in Western India in the course of four years' experience, no case being refused treatment who could possibly benefit by it. Further, no less than 63 per cent of the bacteriologically positive cases became negative and uninfected under treatment.

L. Rogers showed a table of the results obtained by the new methods by the most experienced workers in various parts of the world, with from 10 to 20 per cent recovered in the advanced types seen in leper institutions, and 31 to 41 per cent in the early cases treated at the Calcutta clinic by Muir and himself respectively, the last-named result being obtained by the use of **Sodium Hydnocarpate** intravenously. This method was reported by Perkins, of Culion, as the most active one, and it was not more generally used on account of blocking of the veins often following the injections. Rogers announced that he had recently overcome this difficulty by the use of an *unirritating sodium hydnocarpate* recently made for him by Dr. Henry, a 1 per cent solution of which could usually be repeatedly injected intravenously without trouble and with good results. It was also absolutely painless in a 3 per cent solution subcutaneously under the skin lesions or intramuscularly, and in several cases not progressing on ethyl esters or hydnocarpus oil he had obtained far better results with this preparation, which was also exceedingly cheap. [Burroughs and Wellcome have since put this preparation on the market under the name of **Alepol**, which in powder form, ready for making up the 3 or 1 per cent solutions with 0.5 per cent carbolic acid, can be supplied at one-twentieth the cost of

with the fact that full doses, twice a week for a year, come to about 100 cc. of serum. Munst has found that by drawing up about an equal quantity of blood serum, he put the serum on its long axis with the needle in the vein, and then injected the whole, either a 1 or 2 per cent solution can be injected directly into a single vein without the least pain or irritation, and the patient has confirmed this observation. "A very cheap, painless, and effective treatment is therefore available, which is now being tried very extensively in various parts of the world". Rogers also said he was convinced that about 80 per cent of leprosy infections are house ones, and that the incubation period is under five years in 80 per cent of the cases. He therefore suggests that, by examining the household and close contacts of all known infective cases every six months for five years, 80 per cent of infections would be discovered in the early amenable stages, and could be cleared up before they become infective. By repeating this a second five years very few infections would occur, and wherever this plan is possible, leprosy could be reduced to negligible proportions in a single decade with our present knowledge due to the advantages of treatment.

Other good methods have been applied to leprosy with success by P. A. MacLennan, in the Carville Settlement of the U.S.A., especially in nerve cases with weakened or deformed hands. The principal methods found of use are Massage, Exercises both active and passive, Faradic and Galvanic Currents, Radiant and Ultra-violet Rays, and Diathermy for the relief of pain. In several cases the deformities were relieved, and in others artificial limbs have been applied. He found that the line of treatment is worthy of further study in other leper colonies. Munst reports further success in the case of leprosy complicated with Hg 33 mentioned above. W. H. Hoffmann¹² reports that use of the gold preparation, Krysolgan, and found it to have a valuable effect on the chronic eye complications of leprosy, resulting in the subsidence of the photophobia and irritation and absorption of the lesions; but he thinks further experience is necessary before finally concluding as to its value. Another experience is necessary before finally concluding as to its value, although he has seen improvement after even one or two injections.

¹ *Proc. Roy. Soc. Med.*, 1926, Sept., 18, 365; ²*Ibid.*, 389; ³*Ibid.*, Dec., 1926, 407; ⁴*Ann. N.Y. Acad. Sci.*, 1926, 120; ⁵*Marseille med.*, 1927, June 26, 817; ⁶*Ibid.*, July 25, 1178; ⁷*Ann. N.Y. Acad. Sci.*, 1927, 121; ⁸*Ann. N.Y. Acad. Sci.*, 1927, 122; ⁹*Proc. Roy. Soc. Med.*, 1927, xx, April, 987; ¹⁰*Ann. N.Y. Acad. Sci.*, 1927, 123; ¹¹*Ann. N.Y. Acad. Sci.*, 1927, 124; ¹²*Jour. Amer. Med. Assoc.*, 1926, Dec., 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 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Recovery ensued in most of the cases; in one there was recurrence. A fairly high degree of infectivity was suggested in two cases, as infection appeared to have arisen from proximity to other cases.

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LIVER EFFICIENCY TESTS.

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The difficulties of this problem are well set out by W. P. Murphy,¹³ who writes: "The liver is a complex organ and has many functions to perform. The problem of finding any one test which throws light on all the functions of the liver or which determines the capacity of this organ to perform any one of its varied services, is a difficult one. Moreover, tests used for estimating liver function may be influenced by factors outside the liver, such as obstruction of the bile-ducts, changes in the circulation, and even by changes in the hæmoglobin content of the blood, as this has been shown by Rous to influence the excretion of the bile". Murphy considers that "a practical test of hepatic function must" be quantitative, of simple technique, and require minimal time and equipment.

Many liver efficiency tests are described, and in recent years a large amount of work has been done in comparing the results of one test with those of others. From this work it would appear that the greatest success is reached when several tests are carried out in the same case. Thus S. S. Berger, M. B. Cohen, and J. J. Silman,¹ working with a group consisting of the van den Bergh reaction, Vidal's hæmoclastic crisis, Rosenthal's dye test, and the estimation of the urobilin and bile salts in the urine, conclude that each test represents a different function of the liver, and so it is impossible to decide, on the result of a single test, as to the presence or absence of liver disease. On comparing the results of the tests they used with proved findings, it was found that, where all the tests were positive, severe liver disease, such as toxic jaundice, was present. Where four were positive and one negative the case was one of chronic liver disease. It is interesting to note in passing, that in their series, where the hæmoclastic crisis was the only negative test, the case was one of jaundice due to tumour. Advances have also been made lately in the technique of the dye tests and the icteric index.

Urobilin Test.—This test is being abandoned gradually, owing mainly to our ignorance of the normal metabolism of urobilin. One main origin is from the decomposition of bile within the intestine, but in addition a diseased liver may originate bile directly as a product of its cells or indirectly by decomposition of the bile within the bile-passages.² Kahn gives full details of methods for estimating urobilin in urine, fæces, and serum. He also notes an increase of the urobilin in the urine in diffuse lesions of the liver, such as fatty and parenchymatous degeneration, in cirrhosis, diffuse neoplasms, the congestion of heart disease, and the liver degeneration due to the acute infectious fevers.² In cases of increased blood destruction the urobilin in the stools is increased, and also, at times, in the urine. This last condition may occur even when the liver is healthy.^{2, 3}

Sugar Tolerance Tests.—The lævulose test is the best known, in which 40 to 60 gm. of lævulose are given in about 200 c.c. of water or lemonade, to a patient who has fasted twelve to twenty-four hours. The blood-sugar is estimated before taking the sugar, and again one and two hours after. A rise of 0.03 per cent over the fasting level or a blood-sugar of 0.135 per cent during the test is regarded as positive and is thought to show liver dysfunction. Greene, Snell, and Walters¹ consider the test valuable and use lævulose in preference to other sugars, such as glucose or galactose, as it is readily taken up, easily turned to glycogen, and causes no rise of blood-sugar

in the normal person. They always found high curves where the glycogenic power of the liver was lowered. The l  vulosuria sometimes produced can be neglected, as the renal threshold is a variable one. P. Cohen and S. J. Levin³ consider all carbohydrate tests unreliable and the l  vulose one in particular of little value. Any carbohydrate test is unreliable in the presence of pancreatic disease, and anomalous results have been obtained in cases of pituitary, endocrine, and certain neurogenic disorders.^{3, 4, 5} The strongest attack comes from Mann,⁶ who in certain animal experiments was of opinion that the body can utilize l  vulose with the liver not functioning. This result is opposed to the finding of Sachs in 1899, on which the l  vulose test is founded, and requires confirmation. In the reviewer's opinion the l  vulose is the best of the carbohydrate tolerance tests, provided it is remembered that the liver only plays a part in the general carbohydrate metabolism. Whilst the test cannot be followed blindly in any particular case, it is in accord with clinical findings in a large number, and so can claim a place among the more reliable of liver efficiency tests.

Formation of Urea.—This is a test of great potential value, as it is now generally accepted that the liver is the only organ which has the power to form urea (Mann). Van Slyke found that the blood-urea described a typical curve after a protein meal given to a fasting patient. Four hours after the meal the blood-urea was doubled, and eight hours after the meal it was trebled. Cohen and Levin³ use the white part of a chicken for the meal, giving 1.5 gm. per kilo. of body weight in adults and 1 gm. per kilo. in children. For ease of working they omit the eight-hour examination, and state that in the normal the blood-urea will increase 50 to 70 per cent above the fasting level four hours after the meal. This test has not yet been tried sufficiently to warrant any conclusions, but it is founded on sound principles. It has one inherent disadvantage, and that is the liability to variation if renal disease is present. It is possible, however, that the percentage method of expressing results may overcome this.

Formation of Fibrinogen.—The fibrinogen in the blood is diminished when the liver is diseased or has its function depressed by chloroform or phosphorus poisoning, and it disappears in hepatectomized animals. It is known that the liver plays an important part in the formation of fibrinogen, and that it is the most powerful factor in keeping a constant fibrinogen balance.² The large variations in health (385 to 618 mgrm. per 100 c.c.) limit its use as a liver efficiency test; thus in 14 cases of cirrhosis Rowntree, Marshall, and Chesney found only 6 positive results.² Control of the test is also difficult, for, as Greene and his co-workers have pointed out, tissue injury anywhere in the body will stimulate fibrin production.⁴ Negative findings are of no value.²

Detoxication Tests.—These tests are founded on the power of the liver to get rid of toxic substances from the blood-stream (a) by chemical action in which the toxins are made physiologically inert before excretion, (b) by the liver acting as a filter and merely withdrawing the toxins, as in the dye tests. The chemical change is an oxidation or a conjugation. Thus indol is oxidized to indoxyl and excreted in the urine as indican. The toxic cholic acid is conjugated with glycocholic and taurin to form glycocholic and taurocholic acids, which are excreted in the bile. Thymol, benzoic acid, camphor, cresol, guaiacol, and menthol have all been used to study this liver function.⁴ H. Vesell and C. P. Sherwin have worked with para-aminobenzoic acid; 5 gm. is given by the mouth, and the amount of para-acetylamino benzoic acid estimated in the urine passed in the next twenty-four hours. They have constructed standards of normality, and state that in cases of liver disease the degree of hepatic

dysfunction shown by the test coincided with the approximate estimation made at operation or post mortem.⁷ Tests of this nature are cumbersome, and there is always doubt as to whether the full amount of the test material excreted has been recovered from urine or bile. Much of the preliminary investigation work has been done on animals, and Vesell and Sherwin rightly point out there is a danger in arguing from one species to another in such a matter as liver detoxication. Animals vary, and certain chemical reactions may be limited to a single species.⁷ The same difficulties of collection were experienced at first with the dye tests, but these have been overcome by taking the rate of disappearance from the blood-stream rather than the amount of, or time of, excretion of the test dye in urine, bile, or faeces. As most dye tests are modified by the patency of the biliary passages,⁸ they can have but a limited use. Methylene blue, indigo-carmin, phenoltetrachlorphthalein, bromsulphalein, azorubin-S, and rose-benzol have all been used, but bromsulphalein seems the best.

Phenoltetrachlorphthalein Test.—Details of this test have already been given.⁹ It has been found useful by Berger and Cohen,¹ and in cirrhosis and malignant metastases by H. F. Shattuck, J. C. Browne, and M. Preston.¹⁰ Rowntree¹¹ and Greene⁵ consider it the most useful single liver test. Qualified approval, on account of its many sources of error, is given by Fiessinger and Longchamps¹², while Cohen and Levin³ prefer bromsulphalein. Murphy¹³ thinks the information obtained is of very little value except for showing the degree of biliary obstruction present in those cases where an undoubted pathological lesion exists.

Rose-benzol Test.—This dye is non-toxic and has proved useful in obstructive, catarrhal, and arsphenamine jaundice, in advanced cirrhosis (particularly if ascites prevents palpation of the liver), and in diffuse metastatic malignancy of the liver. It is of no use in cholecystitis.¹⁴ Ten c.c. of a 1 per cent solution of rose-benzol in normal saline are injected into a vein, and the needle is then washed through with saline. Ten c.c. of blood are withdrawn at two, eight, and sixteen minutes after the injection. Each of these samples is centrifuged at 2000 revolutions per minute, for thirty minutes, in tubes into which a few crystals of potassium oxalate have been placed. Five c.c. of the plasma thus obtained is mixed with 10 c.c. of normal saline and compared in a colorimeter with the two-minute sample, which is taken as maximum concentration and regarded as 100 per cent. Using this standard, N. N. Epstein, G. D. Delprat, and W. J. Kerr regard 42 to 52 per cent at eight minutes and 23 to 26 per cent at sixteen minutes as being normal. In their hands the test has proved reliable in selected cases.¹⁴

Bromsulphalein Test.—As regards safety and simplicity of technique, this appears the best of the dye tests. Comparing it with phenoltetrachlorphthalein, it is less toxic and irritating, more sensitive as it leaves the blood more slowly, safer, but up to the present less used.¹⁵ Rosenthal and White introduced the dye in 1925,¹⁶ and their technique as quoted by Friedenwald and Armstrong is as follows:—

“The patient is weighed and the dosage calculated on a basis of 2 mgrm. per kilo. of body weight. The body weight of the patient in pounds divided by 55 will give the exact quantity in c.c. of the 5 per cent solution required. It may be measured by drawing into a sterile 5-c.c. syringe, and then slowly injected directly into an arm vein; the injection should be sufficiently slow to occupy one minute, and care should be taken not to allow infiltration of the dye outside the vein. Thirty minutes after injection, a sample of blood (4 or 5 c.c.) is drawn, preferably from the opposite arm, by allowing the blood to run through a needle directly into a dry test tube. In cases of early liver disease

it may be advisable to obtain also a sample of blood at exactly five minutes after injection.

"After the blood has coagulated it is centrifugalized, and the clear serum is pipetted into two small test tubes. To one of these are added one or two drops of a 10 per cent solution of sodium hydroxide to bring out the colour of the dye, and to the other tube a drop of 5 per cent hydrochloric acid to clear the serum of any hæmolytic. The amount of dye present is now estimated by direct comparison with a series of standards. The tube of clear, acidified serum is placed in front of the standard in a suitable comparator box, and by simultaneously looking through both tubes a comparison can be made with the coloured alkalized serum."

According to Rosenthal and White, under normal conditions five minutes after the injection 20 to 50 per cent of the dye is present in the serum, with an average of 35 per cent, and in thirty minutes the serum is free of the dye.

As a rule no reaction takes place, but slight purgation has been noticed in heavy patients who have been given a large dose of dye.¹⁵ Bulmer regards the results as disappointing, and in his series considered 20 per cent of cases obviously wrong and 80 per cent probably right. The retention of the dye was almost complete in obstructive jaundice, and he thought this due to bile-block rather than liver disease.¹⁵ In justice to the test it must be pointed out that the mechanism of these dye tests depends on patent biliary passages being present, and it is this point which leads Whipple to condemn them all.⁸ Friedenwald and Armstrong¹⁷ record the examination of 55 cases, and found the percentage of dye at thirty minutes as follows: catarrhal jaundice 28 to 36 per cent, cirrhosis 18 to 50 per cent (in 3 cases out of 5), cancer of liver 10 to 45 per cent (in 6 cases out of 8), cancer of pancreas 24 to 32 per cent. No dye was present at thirty minutes in 2 cases of cirrhosis of the liver, 2 cases of cancer of the liver, 1 case of syphilis, 5 cases of cancer of the stomach, 11 cases of chronic cholecystitis, and 17 cases of benign gastric disturbances. It seems fair then to say that the dye tests are reliable in about 70 to 80 per cent of cases, provided certain limitations are recognized. Negative results are of little value. Bromsulphalein is the best dye.

Bile Pigments in the Blood.—Hepatic efficiency can also be gauged by testing for bile pigments in the blood. This may be qualitative, as in the *van den Bergh reaction*, or quantitative, as in the *icteric index*. The former is mainly used in the differentiation of the various types of jaundice. Shattuck, Browne, and Preston¹⁰ regard it as of distinct value as a liver function test, and Greene, Snell, and Walters consider there is a close relationship between the degree of icterus and hepatic efficiency. Collinson and Fowweather,¹⁸ after mentioning the differences which have been suggested to account for the 'two sorts of bilirubin' postulated in the *van den Bergh reaction*, think that the bilirubin giving the prompt direct reaction is an alkali salt, probably the ammonium salt, and the form responsible for the indirect reaction is the free acid. They quote experimental evidence in support of their suggestion.

Icteric Index.—The yellow colour of the blood serum is mainly due to the bilirubin present. In 1917 Blankenhorn suggested that the depth of this colour would determine the amount of bilirubinæmia, and described a method for such determination. This method was improved on by Meulengracht some three years later. Both these observers worked with the blood plasma, but Gram in 1920 suggested that the serum be used, and this modification is still in use. Bernhard and Maue made the actual determination with a colorimeter, using as a standard a solution of 1-10,000 of potassium bichromate and diluting the test serum with normal saline when required. Murphy¹³

compares the test serum directly with known dilutions of potassium bichromate. All these observers worked with blood got from a vein by needling, but Davis¹⁹ has found accurate results using capillary blood obtained from a finger prick. "By this method no attempt is made to determine the actual amount of bilirubin present, but, on the assumption that the colour variation of the serum is due to bilirubin, the increase or decrease of pigment is indicated by comparison with an arbitrary standard. For clinical purposes such a determination should suffice provided there is sufficient evidence to indicate that the colour variations are caused by changes in the bilirubin".²

In Murphy's method 5 c.c. of blood is withdrawn from an arm vein, the patient having fasted for four to five hours, and is allowed to stand at room temperature till the clot has retracted, when it is centrifuged. Clean dry apparatus is employed, and the blood handled as little as possible to avoid hæmolysis. The serum is pipetted off and compared in a simple comparator with the known standards under direct daylight illumination. These standards are made up of dilutions of potassium bichromate in water, corresponding with the colorimetric index figures as follows: 1-10,000 = 1; 1-5000 = 2; 1-2000 = 5; 1-1000 = 10; 1-666 = 15; 1-500 = 20; 1-400 = 25; 1-200 = 50; 1-133 = 75; 1-100 = 100. These solutions are kept in small test tubes of 10 mm. diameter, and the test serum is put in a similar sized tube before being matched. The figure corresponding to the dilution which matches the test serum is regarded as the icteric index of that serum.¹³ Davis¹⁹ uses glass tubing of 2 mm. uniform bore, which is first cleaned in 5 per cent nitric acid for twelve to twenty-four hours, washed in running water, and then dried with alcohol and ether. The tubes are 10 cm. in length and have the ends drawn off to capillary size. A column of blood about 2 cm. long is drawn in after the finger is pricked, allowed to clot, and then the opposite end of the tube sealed. The tube is then placed with the sealed end down in a padded centrifuge tube, and the centrifuge rotated as follows: ten to fifteen minutes at 200 to 400 r.p.m., five to ten minutes at 500 to 1000 r.p.m., one to two minutes at 1000 to 2000 r.p.m. A layer of clear serum forms above the clot which is matched, under diffuse daylight, with standards contained in tubes of the same bore.¹⁹

Sources of error are few and for the main part readily overcome. Hæmolysis upsets the test, and clean dry apparatus is essential. In the capillary method excessive squeezing of the finger should be avoided. As the serum changes colour with time, it should not stand over twenty-four hours. Food lipoids render serum cloudy, so the test should be done on a fasting patient. This is necessary also to avoid error due to the presence of pigments absorbed from the alimentary canal, such as carotin and xanthophyll from carrots, spinach, egg-yolk, etc.^{4, 13, 19} If any doubt exists the serum should be checked by the van den Bergh reaction to make sure the colour is due to bilirubin.^{10, 13}

The normal index is 4 to 6, and in Murphy's series 94 per cent of the cases regarded as normal fell within these limits. The test is of value in differentiating the anæmias, for he found an increased index in 88 per cent of cases of primary anæmia and a decreased index in 82 per cent of cases of secondary anæmia. A high index was present in cases showing bile-duct obstruction rather than liver damage, e.g., carcinoma of the pancreas, catarrhal jaundice. Murphy concludes that "in the absence of anæmia, liver damage, or duct obstruction the index should be normal . . . The test is of considerable practical value to the clinician . . . and is an accurate but easy method of following the progress of a jaundiced patient".¹³ The reviewer cannot agree entirely with his separation of liver damage and bile-duct obstruction. There can be but few cases where a biliary obstruction of any standing is not

accompanied by some liver damage with consequent dysfunction. Davis¹⁹ supports the test; Shattuck, Browne, and Preston¹⁰ consider it the most useful single test there is; J. V. Barrow, E. L. Armstrong, and W. H. Olds²⁰ think it a valuable aid in diagnosis, prognosis, and treatment, but do not regard it as infallible or specific in the diagnosis of any one disease.

General Summary.—The liver is an organ with great reserve power and many functions. Tests of liver efficiency have been devised, founded on the various hepatic functions. The better known of these tests are reviewed above, with a short description of their technique. Most of the tests described have some inherent disadvantage—e.g., difficulty of technique, liability to error owing to disease elsewhere in the body, or the fact that the liver function is only part of a process in which other organs are involved. The best results are obtained by a combination of tests, and no one test should be accepted without confirmation in a particular case. As a rule negative results are of little value. The most used tests are the laevulose tolerance, the bromsulphalein, and the icteric index.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1926, April 10, 1114; ²Fred. Tice, *Practice of Medicine*, 1927, ii; ³*Arch. of Internal Med.* 1927, June, 787; ⁴*Ibid.* 1926, Aug., 248; ⁵*Jour. Amer. Med. Assoc.* 1925, Nov. 7, 1476; ⁶*Ibid.* Nov. 14, 1541; ⁷*Arch. of Internal Med.* 1926, Feb., 257; ⁸*Jour. Amer. Med. Assoc.* 1925, Nov. 14, 1541; ⁹*Med. Annual*, 1926; ¹⁰*Amer. Jour. Med. Sci.* 1925, Oct., 510; ¹¹*Jour. Amer. Med. Assoc.* 1925, Nov. 14, 1541; ¹²*Presse méd.* 1925, July 1, 873; ¹³*Arch. of Internal Med.* 1926, June, 798, and *Boston Med. and Surg. Jour.* 1926, Feb. 18, 297; ¹⁴*Jour. Amer. Med. Assoc.* 1927, May 21, 1619; ¹⁵*Quart. Jour. Med.* 1927, Jan., 101; ¹⁶*Jour. Amer. Med. Assoc.*, 1925, April 11, 1112; ¹⁷*Med. Jour. and Record*, 1926, Dec. 1, 679; ¹⁸*Brit. Med. Jour.* 1926, i, 1081; ¹⁹*Amer. Jour. Med. Sci.* 1926, Dec., 848; ²⁰*Ibid.* 1925, Oct., 519.

LIVER, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

Abscess of the Liver.—Pérard and Roux-Berger¹ discuss their experiences with 46 cases. Of these, 24 were treated surgically, and 8 of these died. They emphasize the frequent vagueness of the history. X rays are often useful, but not infallible. The most constant sign is tenderness at the right edge of the liver. If emetine with sodium cacodylate and stovarsol do not work an improvement, the authors operate, making the incision close to the exploratory needle. Their technique follows the ordinary lines.

Cirrhosis of the Liver.—V. V. Krestovsky,² of Bousoulouk, in Russia, records a case of ascites due to cirrhosis treated with success by a species of Eck fistula. He mentions two previous successful cases from the literature (Rosenstein, Bogoraz). The patient, a man of 24, had been tapped many times and 20 litres of fluid withdrawn at a tapping. The liver was hobnail. The operation was performed below the level of the transverse colon and mesocolon, and the superior mesenteric vein was divided and implanted into the inferior vena cava. The splenic vein was not disturbed. Fine oiled-silk thread was used for the anastomosis. The patient made a good recovery, but needed tapping on two or three subsequent occasions, though only about 5 litres were withdrawn at the later tapplings, and he was able to get about. The method would seem to be safer than the strict Eck's fistula, and may be worth a trial. A technique for making the junction, used by physiologists, is described on p. 241.

Control of Hæmorrhage in Liver Operations.—Duchinova³ finds by experiments on dogs that one may clamp the structures in front of the foramen of Winslow—the hepatic artery, portal vein, and common bile-duct—for half an hour, without serious consequences. The liver becomes completely exsanguinated. There is a marked fall of blood-pressure. The method seems feasible in an emergency.

REFERENCES.—¹*Bull. et Mém. Soc. nat. de Chir.* 1926, lii, 402; ²*Presse méd.* 1926, Nov., 1398; ³*Vestník Chir. i. Pogramených Oblastej*, 1925, v, 34.

LUMBAGO.*Ivor J. Davies, M.D.*

The term lumbago should be restricted to an inflammatory affection of the fibrous tissue in the lumbosacral region. The fibrous tissue involved may be that of muscles and their tendinous insertions, or that of the various fascial bands in this situation. The name is commonly used as a label for any of the various conditions which give rise to lumbosacral pain (e.g., fibrositis, myalgia, myositis). This loose terminology is responsible for errors of diagnosis in a region where pain is projected in many serious states. The anatomy of the part is difficult, for, as P. J. Verrall¹ remarks, we have to deal with a complex system of bones, joints, ligaments, muscles, and nerves. Fortunately, as R. G. Gordon² states, in a great many cases the disability is a simple fibrositis, which is characterized by a tendency to clear up, temporarily at any rate, of its own accord. The features of an acute lumbago are typical of any form of acute fibrositis, and its characteristics should be carefully considered. Should the symptoms not be in accord with those of an ordinary lumbago, the many other possible causes of lumbar backache must be remembered, or serious mistakes may occur. There is no region of the body where greater care should be exercised than in the neighbourhood of the pelvis. The nature of every case of lumbosacral pain should be most carefully investigated, and a diagnosis made as soon as possible. A sufferer is often dismissed with a 'diagnosis' of lumbago without an examination, and may eventually go to an exponent of the so-called 'spinal adjustment', who does at least manipulate the part. The public is becoming sceptical of the long-continued abuse of such general terms as 'lumbago', 'rheumatism', 'sciatica', and certainly now appreciates the correct use of technical terms such as 'fibrositis' which more exactly localize their complaints. Even if a diagnosis of lumbago be correct, treatment is apt to be haphazard, and patients are expected to bear their pain with resignation or even stoicism. Such an attitude is highly discreditable to modern medicine, and applies perhaps generally to what are called minor ailments. We must never forget that such lesser complaints may usher in most serious conditions.

It is only possible here to refer briefly to the principal causes of backache. The main object of this contribution is to induce a more open attitude to the consideration of symptoms which may be indicative of some serious disorder. The complaint may be a muscular ache only, through a slight scoliosis as a result of faulty posture, and the deformity will be obvious in the course of a good method of examination. A simple cause may be quickly found, but no departure should ever be made from a sound routine mode of examination. Verrall¹ summarizes an admirable article thus: "In examining a case of lumbosacral backache, first exclude gross disease, injury, and arthritis, and have a skiagram taken. Then look for outside mechanical causes, and outside causes of overstrain of the nervous system. Finally, remember the paramount importance of the sympathetic system, and seek for referred pain".

A routine general examination should first be made, to include a rectal investigation in men and a pelvic in women. The urine should always be examined. A careful local examination should follow, and in a true case of fibrositis the characteristic nodules may be felt in the lumbar spinal muscles, and near the insertions of the gluteal muscles. The spinal column should, of course, be closely examined. A careful examination of the central nervous system is essential, and may, through an alteration of the tendon and other reflexes, afford early evidence of a compression myelitis, as, e.g., spinal tumour. A spinal tumour is a commoner cause of spastic paraplegia than is generally recognized. Referred pain through the nervous connections from visceral lesions must be borne in mind whenever the pain attributed to a supposed lumbago does not speedily respond to simple measures

of treatment. Verrall gives a good summary of the subject of referred pain, and one of his illustrations may be usefully added: "Fibres from the first two lumbar nerves pass by the aortic and inferior mesenteric plexuses to the colon, etc.; and an overloaded colon, in addition to the backache it may cause by its mechanical weight, and by the toxins it may cause to enter the circulation, may also cause backache (both lumbar and in the buttocks) by pain referred along the distribution of these two nerves". General examination may reveal a source of sepsis pointing to a condition of arthritis of the spine, or other evidence of a focal arthritis may be found. Tuberculosis may be present elsewhere in the body as well as in the spinal column. It is important to bear in mind that tuberculous disease of the spine may be latent in its early stages, and may at first show no evidence on X-ray examination. An old scar may be found on the breast from removal of a tumour which was at the time believed to be benign. Metastatic malignant disease of the spine may thus be suspected, and be subsequently confirmed by X-ray examination. Evidence of syphilis in other parts may be seen, and a gummatous affection of the meninges or vertebræ thus suggested. Rarely, an abdominal aneurysm may be present, and by erosion of the spine cause backache. Carcinoma of the rectum or uterus may be found, or a prostatitis or cervicitis disclosed. Renal calculus may give rise to acute lumbar pain without its characteristic radiation. Perirenal abscess may easily be overlooked unless borne in mind. These are instances of affections attended by lumbosacral backache, some of which are fortunately rare, but which may be revealed in a routine examination.

Anomalies and abnormalities of the lumbo-sacral spine and sacro-iliac joints can only be mentioned, and belong to the realm of the orthopædist, who (with the radiographer) is alone able to recognize the X-ray appearances of many of these conditions, e.g., sacralization of the fifth lumbar vertebra.

TREATMENT.—In simple lumbago the treatment is that of an ordinary case of acute fibrositis and is well described by Gordon² (see also MEDICAL ANNUAL, 1926, p. 404; 1927, p. 48). Permanent relief will not be obtained in the secondary cases until the primary cause has been found, and when possible removed. Briefly, the treatment of an acute attack of ordinary lumbago (fibrositis) is as follows: A brisk purge should be given, and a daily action of the bowels secured afterwards. The patient should be kept in bed on a light diet and encouraged to take bland fluids freely. Local warmth can be most easily applied and renewed by means of a partially filled indiarubber hot-water bag. Aspirin can be given in 10-gr. doses four-hourly for the relief of pain. Later, physiotherapeutic and medical measures described in previous issues of the MEDICAL ANNUAL should be carried out.

REFERENCES.—¹*Brit. Med. Jour.* 1924, ii, 798; ²*Clinical Jour.* 1926, 221. See also "Symposium on the Diagnosis and Treatment of Backache", *Therap. Gazette*, 1925, 609.

LUMBAR PUNCTURE. (See THECAL PUNCTURE.)

LUMINAL POISONING.

Ivor J. Davies, M.D.

A. S. Jackson¹ reports six cases showing toxic signs as a result of luminal administration. Among other conclusions are the following: Luminal is a valuable drug in the treatment of various nervous disorders, and in certain conditions, as insomnia, when occurring in association with organic diseases such as toxic goitre. Its dangers have scarcely been appreciated. The characteristic signs and symptoms of intolerance are the appearance of an erythematous maculopapular generalized skin eruption accompanied by intense itching, fever, weakness, vertigo, and malaise. Treatment consists in the prophylactic warning of the possibility of a reaction whenever the drug is prescribed.

Prompt withdrawal of the drug, the use of local sedatives, and elimination sufficed to clear up these cases promptly. A satisfactory and apparently safe dosage consists in giving $1\frac{1}{2}$ gr. (0.1 grm.) before supper for insomnia, or $\frac{1}{2}$ gr. (0.03 grm.) three times a day for nervous states.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1927, Feb. 26, 642.

LUNG, ASPERGILLOSIS OF.

W. H. Wynn, M.D., F.R.C.P.

M. E. Lapham¹ points out that this disease so closely resembles tuberculosis that it is usually diagnosed as such. There is a common belief that *Aspergillus fumigatus* is purely saprophytic, but nine rabbits inoculated with the mould showed lesions in the lungs, liver, spleen, and kidneys, resembling miliary tuberculosis. The lungs in some cases were solid as in lobar pneumonia. In human beings two types are met with, the wet or parenchymatous and the dry or interstitial. There are varieties according to the location and tissues chiefly involved. In the bronchitic type the mucous membrane is deeply congested, and may be ulcerated, with the formation of a membrane. In the emphysematous type, spores are carried down into the alveoli and spread into the smaller bronchioles, ulcerating them until the lungs are riddled with small cavities. There are also pneumonic, pleuritic, and asthmatic types. The insidiousness and latency of the interstitial type makes the course very like the same type of tuberculosis. It occurs when the spores pass through the alveolar walls and grow in the interstitial tissues. Tubercles form which may remain discrete or become conglomerated, and vary in size from microscopic to as large as a nut. A differential diagnosis from tuberculosis may be impossible without inoculations and cultures. A tuberculous infection may be added to the aspergillosis. The disease is probably not so rare as is usually supposed. During the last three years she has seen ten cases which had previously been diagnosed as tuberculous.

P. Nicaud² also calls attention to the importance of parasitic moulds. The pulmonary mycoses are classified into the mucormycoses, aspergillosis, oosporosis, actinomycosis, and sporotrichosis. *Aspergillus fumigatus* can be grown on Sabouraud's medium or on glycerin-potato at 37° or 38°. It is very pathogenic for the pigeon, rabbit, and guinea-pig. Its habitat is the surface of grain, and it is often found in nasal mucus and saliva. The pigeon-fattener and hair-comber are particularly exposed to infection, the former by holding grain in his mouth or direct contact with the buccal lesion of pigeons, the latter from the rye flour used in defatting hair. Those who handle grain are also exposed. Aspergillosis is frequently implanted on a pre-existing lung condition such as malignant growth, bronchiectasis, or a bacterial infection, but the most frequent association is with tuberculosis. It can, however, be a primary infection, and then simulates tuberculosis. There are cough, fever, and frequent hæmorrhages, and the physical signs may resemble those of tuberculosis. Hæmoptysis may be very frequent and profuse. The duration of the disease may be very long: in one case it was 52 years. In the majority, after remissions and exacerbations a rapidly progressing sclerosis occurs, with or without bronchial dilatation. In rare cases there may be thrombosis of branches of the pulmonary artery. Diagnosis is based on finding the parasite in the sputum. The patient's occupation may suggest the need for a search. Cultures should be made, and will show the mycelium and spores, and inoculations of animals will give characteristic lesions. Antibodies are formed, so that a complement-fixation test is possible, and local reactions resembling those with tuberculin can be obtained by injection of the toxin.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1926, Sept. 25, 1031, ²*Presse méd.* 1926, Dec. 4, 1521.

LUNG, CARCINOMA OF.

W. H. Wynn, M.D., F.R.C.P.

It is evident that there has been a considerable increase in the cases of primary carcinoma of the lung during a period beginning about 1918. K. Ferenczy and T. Matolesy,¹ out of 62,802 post-mortems in the pathological institute in Vienna from 1896 to 1925, found 6791 cases of cancer, and in 282 of these it originated in the lung. In five-yearly periods the numbers were as follows: 1896-1901, 18 cases; 1902-07, 40 cases; 1908-13, 49 cases; 1914-19, 67 cases; 1920-25, 108 cases. The percentage of lung carcinoma to all cases of carcinoma rose from 0.54 in 1896 to 10.3 in 1924. M. Barron,² in Minnesota, found no cases in 1333 autopsies from 1899 to 1911, 4 cases in 206 autopsies 1912-18 (0.2 per cent), and 9 cases in 1006 autopsies in a period of 2½ years from January, 1919, to June, 1921 (0.9 per cent). Of Ferenczy and Matolesy's cases, 204 were in males and 78 in females. Their youngest case was 25 years of age and the oldest 76; 94 cases occurred between 50 and 59, 74 between 40 and 49, and 72 between 60 and 69. Most authors find that the right lung is more frequently involved than the left, and this is supported in this report, as 169 cases were right-sided and 110 left-sided.

Lichty, Wright, and Baumgartner,³ however, in a report on 17 cases, found the primary lesion in the left lung in 11 cases. All but two occurred since 1918; 10 were in males and 7 in females. In their cases certain definite symptoms stood out prominently throughout the course of the disease. In order of frequency they were: pain in the chest, dyspnoea, cough, general weakness, loss of weight, cachexia, fever at some time, and hæmoptysis. Pain was the earliest and most persistent symptom. It always occurred on the side of the lesion, and was occasionally referred to the shoulder and neck of the same side. It was usually worse at night, and was of a continuous deep-seated character. Dyspnoea seemed to be dependent upon three factors: the severity of the pain, the extent of lung involved, and the presence of pleural effusion. It is a comparatively early sign. In 12 of the 17 cases there was an associated cough, irritation of the throat, or hoarseness. Eleven had sputum, and in 5 this was blood-stained. Weakness was a symptom of considerable significance, as it separated the malignant from the benign cases almost at once. While the patient with tuberculosis may complain of feeling weak, the patient with carcinoma of the lung complains of a continuous and progressive weakness. There is no remission, and it is not alleviated by rest. Loss of weight is not so early a symptom as in carcinoma of certain other organs such as the digestive system. In the later stages emaciation is rapid and marked. Cachexia is slow in appearance, but rapidly progressive when it becomes evident. In 11 cases there was a temperature above 99°. Generally the temperature was between 99° and 101°, but in a few cases there were acute rises to 102° or 103° for a few days. Anorexia was remarkably constant, and seemed as pronounced as in alimentary cancer. The early physical signs were indefinite, but in all but one signs became prominent. The patients looked ill and in distress. Movement on the affected side was diminished and lagged. Occasionally superficial veins were distended, but the outstanding sign was impairment or complete dullness on percussion, varying in extent but eventually over a large area, and often due to a pleural effusion. In 7 cases there was a large effusion. Breath-sounds were much diminished or absent. The affected lung was very susceptible to secondary infections, so acute exacerbations were often seen. Metastases were not commonly seen, but in three cases there were signs of metastases in the brain, and in one the tumour penetrated the chest wall and also the diaphragm. In several the supraclavicular glands were enlarged.

Diagnosis has to be made from pulmonary tuberculosis, fibroid phthisis,

unresolved pneumonia, syphilis of the lungs, mycoses, bronchiectasis, interlobar empyema, abscess of the lung, and tumours of the mediastinum. The history of pain in one side of the chest, which is persistent, and loss of appetite, weight, and strength, in a middle-aged person, should arouse suspicion. The X rays should reveal an irregular shadow, showing increase on subsequent examinations. A shadow occupying the greater part of a lung, with light coming through at the apex and at the costophrenic angle, is especially suggestive in the early stage before effusion has occurred. Many examinations of the sputum for tubercle bacilli must be made, but carcinoma and tuberculosis may occur together. Examination of the sputum will also help to eliminate the mycoses, which may present a confusing picture. In no case was the breath and sputum foetid as in bronchiectasis. In mediastinal growths the pressure symptoms are significant and wholly different from the chest pains of carcinoma. Most mistakes in diagnosis are made from not having the possibility of carcinoma in mind. In one unusual case the diagnosis was made from the microscopic examination of a piece of expectorated tissue. Examination of sputum and pleural effusion for cancer-cells should be made, but it is not easy to determine them. Examination of the blood showed a combination of a secondary anaemia with leucocytosis and neutrophilic increase in most cases.

REFERENCES.—¹Wien. klin. Woch. 1927, May 12, 618; ²Arch. of Surg. 1922, May, 624; ³Jour. Amer. Med. Assoc. 1926, July 17, 144.

LUNG, CHRONIC NON-SPECIFIC INFECTION OF.

W. H. Wynn, M.D., F.R.C.P.

After separating out from chronic diseases of the lungs those caused by tuberculosis, syphilis, and the inhalation of dust, there remains a considerable number of cases in which the lungs show signs of permanent damage in the shape of fibrosis, more or less bronchial dilatation, and possibly thickened pleura. Such cases are diagnosed under various names—unresolved pneumonia, chronic pneumonia, interstitial pneumonia, fibroid lung, fibroid phthisis, bronchiectasis, etc. These damaged lungs are more common than is generally appreciated. They appear to have been more frequent in recent years, since the influenza epidemic of 1918, and rival the tuberculous infections in importance and frequency. They are non-specific, for we cannot point to any one organism as responsible, although our own investigations show that the influenza bacillus is present in a majority. Simple fibrosis is reparative, and might be neglected if it were not for secondary results and the continuance of infection. The damage is usually a sequel of an acute infection—repeated attacks of acute bronchitis, unresolved bronchopneumonia, pleurisy; but chronic infection of the upper respiratory tract plays an important part in the etiology. These cases are often mistaken for tuberculosis, and indeed are more often wrongly diagnosed for that disease than any other condition; but whilst occasionally a tuberculous infection may be associated, they do not predispose to that disease, and usually run a separate and parallel course. Their occurrence in children especially has attracted much attention recently.

ETIOLOGY.—Chodak Gregory,¹ in a lecture on pulmonary fibrosis in children, points out that by far the commonest cause is an unresolved bronchopneumonia, in many cases complicating whooping-cough or measles, especially the type of 'wandering pulmonary infection' in which, during a period lasting from three to six weeks or more, areas of the lungs are affected in succession. In marked contrast to lobar pneumonia, in bronchopneumonia there is extensive damage of lung tissue. The walls of bronchioles and alveoli are infiltrated with fluid and cells, while the peribronchial and perivascular tissues suffer in

the same way. Resolution is necessarily slower than in lobar pneumonia and occasionally fails. The inflammatory tissues are then organized, fibrous tissue forms and contracts, some alveoli are collapsed and others isolated by occlusion of terminal bronchioles. In nearly all cases more or less bronchiectasis supervenes. Large cavities are unusual; the cavities are small and are grouped centrally towards the root of the lung. Eventually the pleura is involved and the affected lung becomes closely adherent to the chest wall. Pleurisy may be a primary cause of fibrosis, and exceptionally it may follow lobar pneumonia.

W. V. Mullin² emphasizes the relation of *paranasal sinus infection* to disease of the lower respiratory tract. Experimental investigations have shown that infection can spread from the sinuses to the mediastinal and bronchial glands, with resultant retention of secretion in the finer bronchi. Infection of the paranasal sinuses may be met with in the following stages: acute inflammatory, acute suppurative, chronic suppurative, and chronic hyperplastic. Unless recovery takes place it tends to progress in the above order. The hyperplastic is by far the most important factor in the causation of chronic chest conditions. The thickened mucosa is deeply infected, and bacteria and their products are absorbed through the lymph channels and eventually cause a chronic peribronchial glandular enlargement. There is often a pansinusitis; but the maxillary sinus has the most important etiological significance, as it is subject to infection soon after birth, sufficient aeration and drainage are difficult to maintain, and it is larger and presents a more extensive surface for absorption. Four types of lung infection may be caused by paranasal infection: acute bronchitis, asthma, chronic bronchitis, and bronchiectasis. Acute bronchitis may be merely coincident with an acute upper respiratory infection, but extension through the lymphatics is possible. Asthma may be due to secondary peribronchial infection or reflex causes. The chronic hyperplastic type of ethmoiditis in which the large polypi filling the meatuses cause nasal obstruction is a frequent cause. Protracted flooding of the lymph channels with infective material tends to produce a chronic peribronchitis. Frequent chest colds may be the first evidence of this, but a definite chronic bronchitis is eventually established, and in a neglected case the final result is a bilateral bronchiectasis. A distinction must be drawn between the cases of bronchiectasis secondary to sinus infection, and those due to other causes, such as foreign bodies, fibrosis, and abscess.

C. N. Meader³ suggests the term '*non-tuberculous peribronchitis*', as he regards the process as one which primarily involves the peribronchial lymphatic system and tracheobronchial and hilum lymph nodes. He correlates the increased frequency since the panepidemic of 1918, the great frequency of sinus infection in these cases and at post-mortem in influenza, and the marked resemblance of the symptoms of these chronic cases with those of mild influenza, and considers that the influenzal infection will be found to be primarily concerned in the production of many of these chronic lung infections.

SYMPTOMS.—Gregory¹ gives a good account of the symptoms and physical signs. Pneumonic resolution may be so long delayed that it is difficult to say when fibrosis begins. A few crepitations persisting at the bases for several weeks or even months after bronchopneumonia must not be diagnosed as due to fibrosis. Usually the patient suffers very little once the condition is established, though there have probably been ill health, anaemia, and lassitude during the convalescence from the acute illness. Cough is rarely absent for long, and there is some dyspnoea on exertion. He may live a moderately active life with comfort, but has attacks of bronchitis from time to time. When bronchiectasis supervenes, the symptoms are more distressing. The cough is not frequent, as the mucous membrane becomes less sensitive, but is apt to

occur on change of position, is paroxysmal in character, and results in the production of large quantities of mucopus. Hæmoptysis is common, and often leads to a diagnosis of tuberculosis. The child has a rather characteristic appearance, is generally well nourished, with rather prominent eyes, coarse skin, and bright-red cheeks giving place to cyanosis after exertion. Clubbing of fingers and toes is common. The changes are generally unilateral, and most often at the left base. There may be flattening of the affected side with contraction. The percussion note varies: it may be a flat tympany or resonant. Air entry is poor, so that breath-sounds are diminished though still vesicular; rarely bronchial or cavernous breathing is heard. Dry crackling râles are heard, and, when cavities are present, bubbling and crackling râles of various kinds. They change from day to day. The heart is drawn over to the affected side. The course of the disease is long, and the expectation of life depends chiefly on the amount of bronchiectasis and whether this is progressive, and also upon the amount of care and favourable surroundings.

J. L. Morse⁴ describes the symptoms under the headings of chronic bronchitis, bronchiectasis, chronic bronchopneumonia, and chronic interstitial pneumonia, and it is evident that the symptoms and physical signs will vary according to the pathological lesion which predominates.

Chevalier Jackson,⁵ as a result of bronchoscopic observations, holds that many of the chronic lung suppurations are preventable, the preventable factors being the stagnation of pus in acute and subacute suppurations, the overlooking of foreign bodies in the lung or œsophagus, and the complications of tonsillectomy. More than 200 cases of overlooked foreign body in the bronchi, over half occurring in children, have been seen. The cases of prolonged sup-puration, from 6 months to 40 years, were practically all cases of metallic bodies, vegetable substances being too quickly fatal to cause chronic sup-puration. Two rare causes of infection are congenital stenosis and congenital web, both of which can be relieved by bronchoscopy. A foreign body in the œsophagus may cause serious suppurative disease of the lung, either by inspiration through the larynx or, at a later stage, by ulceration into the trachea or bronchi. During tonsillectomy, foreign bodies smeared with clots and infective agents can go direct from the tonsillar fossa to the lungs under local as well as general anaesthesia. All his patients in whom the foreign body was removed and aspiration practised, recovered.

It is important after tonsillectomy to watch for pulmonary complications during the next four weeks. Early bronchoscopic aspiration will cure most cases. Bronchoscopy is also useful not only in determining the mere presence or absence of suppuration, but for the purpose of differential diagnosis between chronic bronchitis, abscess, bronchiectasis, spirochætosis, neoplasms, bronchial stenosis, and other conditions. In this country foreign bodies in the bronchi, and also complications after tonsillectomy, appear to be less frequent than in America, but their possibility should be borne in mind in connection with chronic infections of the lungs the etiology of which is not clear.

DIAGNOSIS.—In the early stages fibrosis of the lung is difficult to diagnose. Bronchopneumonia, as Gregory points out, must be given two or three months to clear completely in debilitated subjects, and the diagnosis of permanent damage should not be made on a few basal crepitations only. The impaired percussion note and weak air-entry may suggest fluid, but the note is of different quality and the position of the apex beat gives the clue. Once the chest wall has fallen in, the diagnosis of fibrosis is no longer in doubt. The main difficulty in the early cases is to decide whether tubercle is present. Tuberculous infiltration of the lung is generally basal in children, but tends to early caseation rather than fibrotic changes. Sputum may not be available, but

examination of the faeces reveals the presence of tubercle bacilli. The tuberculous child is wasted, has a delicate flushed soft skin, sweats, has evening fever, and the disease has a gradual onset, whereas the non-tuberculous patient is well nourished, has a bright slightly cyanosed complexion with coarse skin, does not sweat, and has usually a previous history of bronchopneumonia. With X rays in the early stages the fibrous infiltration may be seen over the damaged area, the changes being as well marked in the periphery as elsewhere. In tuberculosis, on the other hand, infiltration can be seen extending primarily from the roots. Lipiodol injections will reveal the existence of cavities which may not have been suspected by physical examination alone. Meader states that a history of recurring colds and definite acute infections of the upper respiratory tract are more frequent in non-tuberculous cases, and an onset following an acute respiratory infection is strong presumptive evidence of non-tuberculous disease. Fatigue is more continuous in the tuberculous, but varies markedly from day to day in the non-tuberculous, and in the latter responds more quickly to rest. A week's temperature record may give useful information. In the non-tuberculous cases occasional rises to 99.2° may occur, or the temperature remain subnormal or normal most of the day; persistent rises are unusual except with acute exacerbations. In the tuberculous, persistent moderate elevations and a sharp rise after exercise are characteristic. The pulse-rate in the non-tuberculous is within normal range and may be slow, but in tuberculosis is frequently high even with slight symptoms and signs.

TREATMENT.—J. Brennemann⁶ emphasizes the importance of **Rest, Hygiene, and Nutrition**. The two imperative indications for rest are fever and weakness: it should be absolute rest in bed. When possible, the child should be removed to an equable, warm, sunny climate; when this is not possible, the patient should have as much fresh air as can be obtained, and if sunlight is not available ultra-violet rays should be used. **Cod-liver Oil** is valuable. Rest in bed and fresh air will do much to bring back appetite. It is commonly not so much a question of good food as of conditions that will make the child eat, and for this tactful management is required. The only useful drug for distressing painful cough is **Opium**, which relieves the patient and gives rest. For both irritative non-productive coughs and those with abundant sputum, steam inhalations with compound tincture of **Benzoin** and oil of **Eucalyptus** are rational. Infections of the nose and throat require careful attention; adenoids and tonsils may require removal. Removal of tonsils in children under 3 as a prophylactic measure against recurrent infections has, however, in Brennemann's experience, been disappointing if not useless. Tonsillitis is only part of a widespread infection of the mucous membrane. With bronchiectasis **Postural Drainage** must be systematically practised, and, if this does not suffice, **Bronchoscopy** may be needed. Gregory¹ states that treatment should be directed to keeping the bronchial tree as healthy and free from catarrh as possible. The child should be made to hang over the bedside every morning and evening. Since putrefaction of the sputum is one of the most distressing features, vigorous attempts at **Disinfection** should be made. The methods are: (1) By enclosing the patient in a chamber saturated with creosote vapour for increasing periods of time; (2) Inhalation of disinfectants by the use of Burney Yeo's inhaler; (3) Intratracheal injections of disinfectants, e.g., menthol and guaiacol in olive oil; (4) Administration of pulmonary disinfectants, e.g., creosote and guaiacol by mouth. Artificial pneumothorax is rarely likely to be successful, because the dilated bronchi are unlikely to collapse, as they are supported by dense, inelastic layers of fibrous tissue.

REFERENCES.—¹*Brit. Med. Jour.* 1927, ii, 96; ²*Jour. Amer. Med. Assoc.* 1926, Sept. 4, 739; ³*Ibid.* July 17, 139; ⁴*Ibid.* Sept. 4, 736; ⁵*Ibid.* 729; ⁶*Ibid.* Sept. 11, 801.

LUNG, NON-TUBERCULOUS INFECTION OF—SURGICAL TREATMENT IN CHILDREN.*John Fraser, Ch.M., F.R.C.S.Ed.*

Evarts A. Graham¹ recognizes three main types of acute pulmonary suppuration: (1) Cases in which the suppuration is mainly about the hilum; (2) Those in which it is at the periphery of the lung; and (3) Cases of multiple abscess. After alluding to the frequency with which the aspiration of foreign bodies is the source of pulmonary suppuration, he illustrates the peculiar importance of lung suppuration inasmuch as an abscess cavity in this situation does not readily collapse, because the walls are held apart by a rigid chest wall on one side and adhesions on the other, and he parallels the condition with that of an abscess cavity in a bone. In association with the lung abscess, infection of the walls of the bronchi and destruction of the cartilage lead to the development of so-called bronchiectasis.

The paper proceeds to deal with four different aspects of treatment: (1) Measures against the existing cause; (2) The promotion or improvement of drainage; (3) The collapsing of cavities; (4) The removal of chronically diseased tissues; (5) General supportive (tonic?) measures. Under the first heading is included the removal of foreign bodies and an attack on the invading organism. In the latter connection Graham has something interesting to say regarding cases associated with a spirochætosis, an infection which in his experience occurs in 2 per cent of cases. It has been found that these cases improve with remarkable rapidity under treatment with arsphenamine. He has been impressed by the importance of correcting chronic nasal infection as a preventive measure. Drainage may be established spontaneously or artificially—spontaneously through the trachea, the pleural space, or even through the chest wall to the surface. Spontaneous peritracheal drainage may be facilitated by placing the patient in a dependent position, and for this Graham and his colleagues have designed a suitable table. Artificial drainage is achieved by using the bronchoscope with suction. Drainage by surgical access through the chest wall is only permissible when a large abscess is situated at the periphery of the lung, and in this event, unless the overlying pleural space is obliterated by adhesions, the operation should be done in two stages. The collapsing of cavities may be aided by such means as pneumothorax, phrenic avulsion, and thoracoplasty. The removal of infected tissue may be read as meaning lobectomy, and Graham has found that the formidable mortality usually associated with the procedure may be reduced by the multiple stage cautery reaming method.

The contribution is a stimulating one, for it helps one to realize how much has been done, and is being done, to improve the risks in this difficult field. (*See also BRONCHIECTASIS.*)

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1926, Sept. 11, 806.

LUNG, SILICOSIS OF. (*See SILICOSIS.*)

LUNG, TUBERCULOSIS OF. (*See TUBERCULOSIS, PULMONARY.*)

LUPUS ERYTHEMATOSUS. *A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.*

Treatment by Gold Preparations.—Reports continue to be published on the treatment of lupus erythematosus by various gold preparations. J. F. Schamberg and C. S. Wright¹ have prepared a sodium and gold thiosulphate preparation, resembling 'sanocrysin', and report results in 25 cases. The eruption disappeared in 5 and almost disappeared in 6 cases, while improvement occurred in 12 (some of which were still undergoing treatment). The authors consider that these figures are very satisfactory when the intractability

of the disease is considered. They call attention to certain toxic effects which may occur when these preparations are used:—

1. *Foreign protein reactions* may occur when colloidal gold protected by some protein is used. These usually take the form of headache, suffusion of the eyes, and chill occurring an hour or so after the injection, and are usually quite transitory, lasting half an hour or more.

2. *Toxic reactions* due to the gold compound. The symptoms may include chills, fever, nausea, vomiting, headache, and prostration. The fever and malaise may last for two weeks or more. In some cases diarrhœa with bloody stools and severe stomatitis has occurred. A few cases were fatal. In addition to these general manifestations, cutaneous reactions have been observed, such as itching of the skin and urticaria. In some cases the febrile reaction has been associated with a 'flare up' of the lupus erythematosus eruption and new lesions have developed elsewhere, though it has been a moot point whether these are true lupus erythematosus lesions or a toxic eruption due to the drug.

3. *Immediate reaction.* Görl and Voigt² describe severe general reactions in 3 and slight in 2 cases following injections of 'triphyl'. In the most severe case the patient became unconscious two minutes after the third of a series of injections, and pulse and breathing ceased, but the patient was resuscitated in the course of half to three-quarters of an hour. This was followed by diarrhœa and vomiting, and nine hours later by hemiplegia, which slowly regressed in the course of a few weeks. Schamberg and Wright consider that these latter reactions were due to some impurity in the preparation or to some dissociation of the compound.

These authors consider that the sodium and gold thiosulphate compound can be tolerated in proportionately larger doses than the other gold compounds. They recommend an initial dose of 50 mgrm. in chronic cases, followed by a second dose of 100 mgrm. in five to seven days. This dose is then repeated once a week, and in some cases twice a week. They recommend a second course after the lesions have disappeared in order to prevent recurrence. In the acute cases the drug is given much more cautiously, beginning with 25 mgrm. and increasing very gradually to 50 and 100 mgrm.

D. Olah³ also reports 4 cases of 'triphyl' dermatitis. In all cases the initial eruption in his cases consisted of groups of itching papules, generally occurring on the hands but in one case on the face only. In 2 cases these went on to a severe universal dermatitis, with œdema of the face, hands, and feet, and accompanied by fever and gastro-enteritis. The general eruption resembled that of salvarsan dermatitis.

O. Naegeli⁴ relates four cases in which skin lesions appeared after the injection of 'sanocrysin'. The cases treated were not lupus erythematosus, but one of disseminated lupus vulgaris, one of lupus vulgaris and scrofuloderma, one of Darier-Roussy sarcoid, and one of erythema induratum (Bazin). The eruptions were unlike any drug eruption, but resembled tuberculides in their clinical and histological character. Naegeli believes that 'sanocrysin' is capable of producing such eruptions by freeing of endotoxins from the tubercle bacilli.

Other Methods.—P. Ravaut and Bocage⁵ have treated 23 cases of lupus erythematosus with Novarsenobenzol. In 7 the eruption disappeared completely, in 4 almost completely, in 4 there was marked improvement, in 2 no good results were observed, and in 6 cases the treatment had to be abandoned. Toxic reactions of various kinds were observed in a number of cases but were transient.

REFERENCES.—¹*Arch. of Dermatol. and Syph.* 1927, Feb., 120; ²*Munch. med. Woch.* 1926, Aug. 6, 1360; ³*Wien. klin. Woch.* 1927, June 9, 749, ⁴*Munch. med. Woch.* 1926, Nov. 12, 1929; ⁵*Ann. de Dermatol. et de Syph.* 1926, Dec., 657.

MALARIA.*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

EPIDEMIOLOGY.—An interesting coloured malarial map of India has been published by S. R. Christophers and J. A. Sinton,¹ in which the moderate and hyperendemic tracts of eastern India and the Bombay coast are shown; and they present moderate seasonal variations in high rainfall areas, but no fulminant epidemics. On the other hand, various areas of the Punjab are liable, after unusually heavy rain, to fulminant malarial epidemics attended by a very high mortality and spleen rates, followed by a gradual fall of the spleen rate during the following years. It is in these areas of the Punjab that reliable forecasts of the autumn malarial incidence have been made by C. A. Gill in recent years. Elevations above 5000 feet have little or no malaria, and Eastern Bengal and small areas of the east coast have the lower rates of the plains, but jungly hill tracts below 5000 feet suffer severely and may also show blackwater fever. A. Bidault,² in North Syria, found that the removal of a military camp from a very malarious spot near a swamp, to an elevation of about 180 metres, enabled the disease to be reduced to very little. In Northern Argentina N. C. Davis³ considers *A. pseudopunctipennis* to be the only carrier in this area, as Paterson stated in 1911. The disputed question as to whether repeated, direct passage of the malarial parasite by inoculation from one person to another in the treatment of general paralysis modifies the organism is further discussed by W. Yorke and W. R. Rees,⁴ who report no change after fifty-four passages in the course of three and a half years, at the end of which it infected *A. maculipennis* readily. The large amœboid form of malarial parasite described by J. W. W. Stephens as a new organism under the name of *Plasmodium tenue* has been found by J. C. J. Callanan⁵ to be produced by distorting red corpuscles with ordinary ring forms in them by means of pressure, so it is not a distinct organism.

PROPHYLAXIS.—General malarial control in Tropical America is discussed by W. E. Deeks,⁶ and in addition to the prevention of anopheline breeding he lays much stress on **Screening of Houses**, as illustrated by the fact that the infection rate is 6.6 per cent among whites in screened residences, as compared with 29.1 per cent among the labourers in unprotected houses. He also thinks that the cure of malaria carriers has not been sufficiently emphasized. In chronic cases of malaria he recommends combining **Iron, Arsenic, and Nux Vomica** with small doses of **Quinine**. W. V. King and G. H. Bradley⁷ report on prophylaxis in Louisiana by means of *dusting mosquito-breeding swamps by means of aeroplanes* with a mixture of 5 to 20 per cent of **Paris Green**, and an inert diluent dust, such as Tripoli earth, road dust, sand, cork dust, calcium carbonate, diatomaceous earth, or a mixture of lime and flour, the first having been most used by them. Under average conditions 5 lb. of a 10 per cent Paris-green mixture per acre is required, advantage of the wind being taken in distributing the cloud of dust. Unfortunately the application has to be repeated every eight or nine days, which is rather costly, but less so than by hand distribution. The *use of fishes in mosquito control* in India is discussed by S. L. Hora,⁸ and he points out that the Madras fishery department alone stocks and supplies larvicidal fish at present in that country, but they are useless in tanks unless they are free from common predatory fish. P. A. Dalal and E. E. Madon⁹ found Paris green too expensive in the case of Bombay mill-ponds, and advise driving **Steam** through the water where available, or else oiling with 3 parts of **Crude Oil**, 2 of **Kerosene**, with 0.1 to 0.2 per cent **Castor Oil**, at the rate of one gallon per 100 sq. ft. of surface, as cheap and efficient. J. N. Leitch¹⁰ pleads for the isolation of malaria cases in a screened hospital as a prophylactic measure.

PATHOLOGY.—Hourly *leucocyte counts* have been made in malaria-treated

general paralytics by H. A. Bunker¹¹ during the rigor and fever, who found a definite reduction at the time of the chill in 30 out of 33 instances, followed after about two hours by a moderate leucocytosis in 27 out of 35. The same thing occurs after the intravenous injection of various protein substances, indicating that the periodical discharge of the merozoites from the ruptured red corpuscles acts by producing protein shock. G. de M. Rudolf and J. C. E. Ramsay,¹² reporting on the enumeration of the malarial parasites in therapeutic malaria, found in only 5 of 10 a relationship between the number of parasites and the degree of fever. J. G. Thomson and S. Annecke¹³ emphasize and illustrate the observations of Seyfarth and others on the occurrence of *nodules in the brain* in fatal cases of cerebral malaria. R. B. Lloyd and G. C. Maitra,¹⁴ discussing the *Wassermann reaction*, conclude that malaria in itself does not give positive reactions with the present reliable technique. T. A. Hughes¹⁵ has made careful observations on the serum bilirubin and on the urobilin in the urine in a series of cases of malarial fever, and also in cases of jaundice suspected to be due to infection with *Spirochaeta icterohemorrhagiae*, although this organism was not demonstrated. He concluded that in uncomplicated chronic malaria there is no relationship between the degree of urobilinuria and that of bilirubinæmia, and he holds that in malaria the urobilin originates in the intestine from bilirubin.

The complement-fixation reaction has been investigated by A. N. Kingsbury¹⁶ with a view to obtaining a diagnostic measure in chronic latent infections. Only 3 of 12 of *P. vivax* and 7 of 25 of *P. falciparum* infections showed no reactions, but 2 quartan cases gave negative results. Each of the other plasmodia reacted best with antigens made from the same type of infection, and the reaction was best marked with cases of long-standing infection. P. Manson-Bahr¹⁷ records prolonged attempts to produce an antigen from mosquitoes infected with malaria or with proteosoma of birds, with negative results owing to his not being able to obtain sufficient infected material under the difficult conditions of work in the cold climate of England, and he suggests further trials in the Tropics on this line.

A new test for the *differentiation of malaria from kala-azar, enteric, and other fevers* is recorded by E. C. Hodgson, A. C. Vardon, and Z. Singh¹⁸ by means of the simple procedure of drawing up into a sterile syringe one part of 5 per cent citrate of soda and four parts of the patient's blood, and placing the mixture in several narrow glass tubes about 5 mm. wide and 60 mm. long, marked at 6, 12, 18, and 24 mm. from the bottom, and filled up to the 24-mm. mark. The rate of precipitation of the red corpuscles and the colour of the supernatant serum is then noted; in healthy persons there is very slow sedimentation, the corpuscles never falling below 23 mm. within half an hour, while the supernatant fluid has only a faint-yellow colour. In malaria the red corpuscles appear dark and the supernatant fluid is decidedly yellow, or even greenish-yellow or reddish-yellow, this very marked yellow colour of citrated serum being seen in every malarial blood so far tested, but not in any other fever. In kala-azar there was very rapid sedimentation of the corpuscles to below the 18-mm. mark within less than half an hour, as also occurs in the presence of suppuration, while the supernatant fluid has a colourless or faint greenish-white appearance. In typhoid the corpuscles are not so dark, and the supernatant fluid had a faint cloudy milky-white colour. The yellow serum was met with in malarial cases with no fever for a month if untreated with quinine, and it did not give the absorption bands of hæmoglobin or methæmoglobin, and it generally disappears after a few days' quinine treatment. Further reports on this test will be awaited with interest.

G. Macdonald,¹⁹ who reports on the examination of the blood of over 1000

children in Sierra Leone, where he found a hyperendemic area in close proximity to breeding places of *A. costalis* in a stream traversing the town, and a less infected endemic area not far away, concludes that the proportion of children with temperatures of 100° and over may prove a simple and useful index of the prevalence of malaria in an endemic area.

TREATMENT.—The synthetic preparation of a substance, **Plasmochin**, having a definite action on malarial parasites, is a matter of great interest. It is a complicated body known as alkylamino-b-methoxyquinoline, but its detailed formula has not been revealed by the makers, Bayer and Co. Sioli proved experimentally on canaries infected with malaria that the drug administered by the stomach had an effect on the parasites, and Muhlens tried it in 134 cases of malaria in Hamburg, and found it had most effect in benign tertian and quartan infections, and that it had a remarkable action on the gametocytes on crescents, which disappeared from the blood in four to seven days, as compared with a considerably longer period under quinine. P. Manson-Bahr²⁰ reports on a trial of the drug in 0.1-grm. doses, as 0.15 or over is a toxic dose, and found it unsatisfactory in malignant tertian infections unless a small quantity of quinine was added, and that serious cyanosis developed in 3 out of 8 cases. He confirmed its remarkable action on crescents, and he hopes it may be a beginning leading to the synthesis of more satisfactory preparations. J. G. Thomson, in the discussion on this paper, pointed out that the margin of safety was very small on account of doses only a little above the therapeutic ones being so toxic. The cost of the preparation was not stated, but it seems likely to be high.

The **Indian Cinchona Febrifuge** has been tried by O. A. R. Berkeley-Hill²¹ under favourable conditions for continued observation, and he had only 14 per cent of relapses in 43 cases within sixty days, so considers it a cheap and efficient preparation. As he found diarrhoea after Acton and Knowles' prescription, he prefers to give it in the following mixture :—

R	Pulv. Cinchon. Febrif.	gr. x	Spt. Anisi	℥℥ x
	Pulv. Acid. Citrici	gr. xx	Syr. Simpl. et Aq.	ad 5j
	Mag. Sulph.	gr. x		

This is to be given three times a day diluted with water two and a half hours after food, and continued for a full month. If sickness occurs, 10 gr. of quinine should be substituted for the same amount of cinchona febrifuge.

Stovarsol in malaria is reported on by A. J. Sinton,²² and he found that it did not prevent relapses in the majority of benign tertian cases, but *P. vivax* disappeared from the blood within 48 hours in 98 per cent of cases treated by 1-grm. doses orally. In some chronic cases it appeared to provoke increased febrile reactions. J. N. Leitch²³ has studied the carbohydrate metabolism in **Artificially Induced Malaria** in general paralytics, and he found glycosuria in only 0.9 per cent of untreated cases, but in 15.4 per cent at a single examination, and 90 per cent after repeated urine tests, in those treated with benign tertian malaria. The blood-sugar curve varied inversely with the rise of temperature, and the administration of glucose during the fever relieved only the subjective symptoms, but insulin injections were followed by a termination of the fever in 60 per cent of the cases; relapses followed with a lower degree of pyrexia than after quinine treatment.

The Blackwater Fever Complication.—The hæmoglobinurias have formed the subject of an interesting paper by J. W. W. Stephens,²⁴ and of a discussion by a number of authorities at the Royal Society of Tropical Medicine and Hygiene, without throwing any fresh light on the subject. G. H. Wipple,²⁵ in a careful description of the pathology of blackwater fever, concludes that a comparison

of the brain in this disease and in malaria shows such great resemblance that both diseases must be due to a circulating poison with very similar action, but more intense in blackwater fever, which is probably "malaria plus an unknown factor—probably a poison that develops as a result of some reaction against malaria". T. Weitzman²⁸ records a case of blackwater fever in Palestine, where he states it was previously unknown.

TREATMENT.—R. W. Burkitt²⁷ advises combating the acidosis accompanying malaria by injecting intravenously two pints of **Physiological Salt Solution** containing one ounce of **Sodium Bicarbonate**, and to combat the malaria he gives two teaspoonfuls of tincture of **Cinchona** in water every three hours, and increasing this rapidly to liquid extract of cinchona and then to **Quinine**, as he thinks the whole-bark alkaloids are less likely to induce blackwater in chronic malaria than quinine.

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MALTA FEVER.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

A. Alessandri¹ has described an epidemic outbreak of Malta fever among goat-keepers, with 40 cases in three months, and one group, who had not consumed goat's milk but were attacked, inquiry showing that they had been employed in cleaning goat stalls. There had been cases of abortion among the goats, but not among cattle. F. Bua² has obtained positive reactions in 5 Malta-fever cases, and negative ones with 51 cases of other diseases by the intradermal test with *B. melitensis*. T. G. Hull and L. A. Black,³ as the results of tests in the Illinois State, think Malta fever is more common in the United States than is usually suspected. H. Roger,⁴ working in Marseilles, describes cases of *spondylitis* complicating Malta fever, the sacro-iliac joint being most frequently affected, the disease simulating chronic rheumatism. *M. melitensis* Vaccines were used with advantage.

REFERENCES —¹*Policlinico*, 1926, Sept. 27, 1345; ²*Ibid.* 1927, May 2, 631; ³*Jour. Amer. Med. Assoc.* 1927, Feb. 12, 463; ⁴*Presse méd.* 1926, July 24, 929.

MASTITIS, CHRONIC.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Solid tumours of the breast and tense cysts should be removed whenever they are discovered. It is often impossible to distinguish between a tense cyst and a non-malignant solid tumour. Of the latter, fibromata, fibromyxomata, and fibro-adenomata are the most common. Not infrequently a carcinoma develops in one of these benign neoplasms. Very often a bloody discharge from the nipple is caused by a papilloma of one of the ducts, and a simple amputation of the breast is alone required. It is in cases of chronic mastitis that the surgeon finds most difficulty in recommending surgical treatment. The condition is seen in young women. It is often bilateral; nodular masses can be detected on both sides. Unlike cancer, these nodular masses vary in size from time to time, and frequently give rise to pain in the breast extending down the intercosto-humeral nerve into the arms or chest. The glands in the axilla are not enlarged. During the menstrual periods there is more local tenderness

and increased pain. In older women a cystic type of mastitis is more common. Chronic cystic mastitis is sometimes referred to as Reclus's disease, or Schimmelbusch's disease. In some cases there is a discharge from the nipple. Cysts of various sizes form both in the acini and the ducts. It is often difficult clinically to differentiate chronic cystic mastitis in a woman, 50 years of age, from cancer. Diffuse carcinoma of the breast presents a very similar picture to chronic cystic mastitis. Both conditions may be combined, and microscopic examination is not always conclusive. Skilled pathologists have often difficulty in distinguishing the one from the other. It is not unreasonable to classify chronic cystic mastitis in middle life as a precancerous condition. Sistrunk (Mayo Clinics, 1922) has dealt with many of these points, and adds that the medical treatment of chronic cystic mastitis is unsatisfactory. In addition to a sling to support the breast, the application of a weak solution of tincture of iodine or of mercurial ointment is all that can be done. Little has been accomplished by the use of X rays. In young people chronic mastitis need cause no special anxiety, and in the older women who develop simple chronic cystic mastitis the condition usually disappears after the menopause. There is, however, a clinical group in which it is impossible to be certain that the breast is not malignant, and in such cases it is better to do a radical operation, even if occasionally it is found on pathological examination that the disease was innocent. It is best to err on the safe side. It is no use removing a portion for examination, as in this mixed type of cases the specimen taken may be innocent, and yet may have lain alongside a cancerous growth. In single solid tumours or tight cysts the problem is a different one. If any doubt exists, an immediate microscopic examination is conclusive.

MEASLES.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—W. Pockels¹ reports 60 cases of measles in adults from 16 to 45 years of age who had been admitted to the Eppendorf Hospital during the last ten years. With 3 exceptions the temperature became normal within five days of admission. Only 8 had any complications, and there was only one death, in an asthmatic subject 18 years old; 10 had an abortive attack, the fever lasting only one day; 9 gave a previous history of measles in childhood, but it was very doubtful if the disease really was measles on the first occasion. Pockels concludes that the prognosis of measles in adults is much better than in children. [Measles, however, may be a severe disease in adults when it occurs on a virgin soil, especially when a large number of men are brought together in one place, as was the case in the epidemic in the Highland Division at Bedford (see MEDICAL ANNUAL, 1923, p. 270).—J. D. R.]

G. W. Ronaldson² records a case of *measles at confinement with a modified attack in the child*. The term 'congenital measles' was not applicable, as the separate existence of the infant, who did not develop any symptoms until the fifteenth day of life, was sufficiently long to permit of extra-uterine infection, although infection in utero could not altogether be excluded. Ronaldson attributes the modified character of the attack to the fact that he allowed the mother to suckle the infant, in view of the probable immunizing influence of the maternal milk. The reviewer, whom Ronaldson quotes, has pointed out that there are cases on record in which the infant has escaped the disease altogether, though it was suckled by its mother. In no case therefore should the existence of measles in the mother form a contra-indication to suckling, as, if the infant is susceptible, infection will have taken place by the time measles has been diagnosed in the mother.

S. Erdheim³ reports two cases of *second attacks* in measles which presented the following points of interest: (1) The subjects were brothers, 6 and 2½ years

old respectively at the time of their first attack. A familial predisposition to measles has been noted by other observers. (2) The interval between the attacks was almost exactly one year in each case. (3) The second attack of the elder brother was more severe than his first attack, though as a rule the second attack is milder than the first, as was the case in the younger child. There was nothing anomalous or characteristic in the clinical picture of the second attacks. (*See also MEDICAL ANNUAL, 1926, p. 313.*)

J. B. Neal and E. Appelbaum⁴ have seen more cases of *encephalitis* following measles than any other acute infectious disease. The clinical picture varied considerably. The onset was usually sudden, during or a few days after the attack of measles. Fever and headache were almost constant. Vomiting occurred in only a few. Convulsions were present in about half the cases, and sometimes were very severe. The most striking symptoms were referable to the mental condition, which was characterized in some by irritability and in others by profound stupor or delirium. Paralysis occurred in one-third of the cases. Hyperæsthesia was fairly common. Signs of meningeal irritation were noted in a fair proportion of cases. The spinal fluid was usually under increased pressure, and showed a slight or moderate increase of mononuclear cells, but was quite sterile. Out of 12 cases, 3 died, and of the 7 who were followed up, all but one made a complete recovery.

A. Reuland⁵ made a study of *desquamation* following measles in seventy cases, and came to the following conclusions. With very few exceptions desquamation occurs in every case. Its onset takes place immediately after the appearance of the eruption, the first signs developing between the second and fourth day from the outbreak of the rash. It lasts usually only a short time—7 to 8 days on the average; more than 16 days is exceptional. It is confined in at least half the cases to the face, and is almost always found there first. Only certain parts of the rest of the body are involved, especially the back and sides of the trunk and the extensor surface of the limbs. The hands and soles usually escape. The desquamation is almost always branny in character. Its degree does not always depend on that of the eruption, although intense desquamation only occurs after an intense rash, and a faint rash is usually followed by slight desquamation.

M. Paillet⁶ illustrates the rarity of *lobar pneumonia* in measles by the fact that only three examples occurred among 3000 cases of measles at the Hôpital Claude Bernard, Paris. According to the literature and his own experience it develops only in convalescence. There is therefore a succession of one disease by another rather than an association of two diseases. The incidence of this post-eruptive pneumonia does not seem to be greater than can be explained by a mere coincidence.

DIAGNOSIS.—R. Tunnicliff and R. E. Taylor⁷ state that in skin tests with killed cultures of the green-producing diplococcus associated with measles, Tunnicliff obtained positive reactions in 100 per cent of persons who had not had measles, and in only 4 per cent of those with a history of measles. This intracellular toxin was neutralized in persons with a negative history of measles by convalescent human serum, but not by the serum of a person who had not had measles. Antigens of killed measles diplococci are therefore more effective for susceptibility tests than the extracellular toxin demonstrated by Ferry and Fisher, by which they produced skin reactions in only 40 per cent of persons with a negative history of measles and in 3 per cent of persons with a history of measles (*see MEDICAL ANNUAL, 1927, p. 288*).

PROPHYLAXIS.—R. Debré, P. Joannon, and K. Papp⁸ record their attempts to produce *active immunization against measles*. They used as an antigen the blood of a measles patient with an ordinary attack at the onset of the eruption,

and found that the virus content of the blood was sufficiently constant for a definite dilution of blood always to produce the same reaction in inoculated subjects; $\frac{1}{400}$ c.c. of blood diluted with saline was injected on two occasions, with an interval of three weeks between the two injections. Their experience, however, at the time of publication had not been sufficiently long to enable them to say if the immunity so obtained was permanent.

R. Tunncliffe and A. L. Hoyne⁹ immunized goats by intravenous injection of green-producing measles diplococci and their filtrates, and thus produced an antibacterial and antitoxic serum. Four to six c.c. of the serum were injected into children 1 year old and older, and a few nurses with a negative history of measles after definite exposure to the disease. The serum prevented an attack in 45 per cent of those injected on the fourth day after contact with measles, and in 97 per cent of those who received it within the first few days after exposure. Local and general serum rashes occurred in only 12 per cent of those injected. The writers hold that though the duration of passive immunity conferred by immune goat serum is only a few weeks, the serum is useful in preventing measles in very young and sick children and in stopping epidemics in institutions. Tunncliffe's immune goat serum has also been employed with success by A. L. Hoyne and B. M. Gasul,¹⁰ who injected 39 infants and children exposed to measles, with the result that 34 escaped an attack altogether and 5 had a mild attack without any complications, whereas of 9 contacts who did not receive serum all but one contracted measles, and one died. More recently R. Tunncliffe and B. White¹¹ have prepared a serum by immunizing a horse with injections of carbolized broth cultures of the diplococcus, and, when basal immunity was established, with injections of living diplococci. Children exposed to measles infection were injected with this serum, which apparently completely protected a few, partially protected some, and gave no protection to others. Further clinical tests are being carried out.

The failure of Degkwitz's sheep serum to confer immunity and the severity of the serum sickness following its use (to which allusion was made in the MEDICAL ANNUAL, 1927, p. 290), has been emphasized by several subsequent writers such as Schlossmann,¹² Baron,¹³ and Zoepfel.¹⁴

Commenting on an excellent paper by W. S. C. Copeman¹⁵ on the *serum prophylaxis of measles*, the reviewer¹⁶ stated that though he had no practical experience of the subject he could claim a fairly wide literary acquaintance with the method, to which he had drawn attention in the MEDICAL ANNUAL since 1920. As regards the dangers and drawbacks connected with it, in spite of the very large scale on which it had been carried out, only three deaths had been reported, viz., two by Vassal and one by Schlossmann (*see* MEDICAL ANNUAL, 1927, p. 290), and the only other untoward circumstance was tuberculous infection of the site of injection reported by Kundratitz, following inoculation of serum from measles convalescents who had a positive Pirquet reaction but no clinical evidence of tuberculosis. The chief drawback to the method was the difficulty in obtaining convalescent serum even when rewards were offered to donors. In large towns such as Paris or Brussels the difficulty had been overcome by the establishment of serum centres, but in small towns it had been apparently insuperable, and had led to the adoption of other methods. The reviewer does not think that convalescent serum need be used on so large a scale as Copeman and other enthusiasts recommend, and is not in favour of its application in well-to-do families or hospitals with a hygienic environment, as in his experience measles contracted under such circumstances usually runs a favourable course.

REFERENCES.—¹*Deut. med. Woch.* 1927, 1053; ²*Brit. Jour. Child. Dis.* 1926, 192; ³*Ibid.* 195; ⁴*Jour. Amer. Med. Assoc.* 1927, lxxxviii, 1552; ⁵*Jahrb. f. Kinderheilk.* 1927,

cxv, 202; ⁶*Thèse de Paris*, 1926, No. 386; ⁷*Jour. Amer. Med. Assoc.* 1926, lxxxvii, 846; ⁸*Ann. de Méd.* 1926, 343; ⁹*Jour. Amer. Med. Assoc.* 1926, lxxxvii, 2139; ¹⁰*Ibid.* 1184; ¹¹*Boston Med. and Surg. Jour.* 1927, cxevii, 272; ¹²*Klin. Woch.* 1926, 1824; ¹³*Med. Klinik*, 1927, 48; ¹⁴*Munch. med. Woch.* 1927, 150; ¹⁵*Proc. Roy. Soc. Med.* (Sect. Epidem.), 1927, xx, 79; ¹⁶*Ibid.* 87.

MENINGITIS, TUBERCULOUS.

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

Tuberculous Meningitis following Head Injuries and Concussion.—A considerable proportion of individuals harbour tuberculous foci in the bronchial glands at the roots of the lungs, as well as in the lungs themselves. Moreover, there is scarcely anyone, especially during childhood and adolescence, but has some sort of accidental bodily concussion. It is therefore remarkable how seldom one observes a causal connection between such accidents and the subsequent development of tuberculous meningitis, with or without definite miliary tuberculosis. F. Schultze¹ has recently discussed this question and has tabulated a series of eleven clinical cases from German literature in which the first signs of tuberculous meningitis became evident within a few days or weeks after an accident of some sort. The trauma must be of sufficient violence to rupture a pre-existing tuberculous focus and to permit escape of tubercle bacilli into the blood- or lymph-stream. Moreover, it seems probable that head injuries, producing a degree of bruising of the meninges, may thereby diminish their resistance to the tubercle bacilli, by affording a *locus minoris resistentiæ*. The sort of injury recorded in Schultze's cases was generally a fall on the head or back, e.g., from a ladder or down a flight of stairs; less commonly the exciting trauma was a blow on the head, e.g., from a heavy weight, a blow with a fist, or being butted by an angry bull. The immediate sequelæ were those of headache or of actual cerebral concussion. After an interval without special symptoms, meningeal symptoms developed, on a date varying from three to eleven days after the accident. In all save one patient the cases terminated fatally, usually within four weeks, in one after three months and in one after fourteen weeks. In every fatal case tuberculous meningitis was demonstrated at autopsy, and in nearly every case caseous bronchial glands were also present. In the eleventh case, which recovered, the diagnosis of tuberculous meningitis was established beyond doubt by the presence of tubercle bacilli in the cerebrospinal fluid. Of course, as Schultze admits, these patients might all have developed tuberculous meningitis without the occurrence of any trauma. Further studies are therefore necessary before we can consider the effect of trauma established as a causal factor in such cases. The point, however, may occasionally be raised in connection with accident insurance policies.

REFERENCE.—¹*Munch. med. Woch.* 1926, Nov. 26, 2009.

MENTAL DEFICIENCY.

Henry Devine, M.D., F.R.C.P.

*Sterilization of Mental Defectives in America.*¹—Few people who have not made a study of the subject realize to what extent the sterilization of criminals and mental defectives has been sanctioned by the legislatures and courts in America. A recent case, which upheld the main provisions of the present Michigan statute authorizing the sterilization of mentally defective persons, is one indication of what seems to be a growing popular approval of such statutes. In this case, however, the order of the probate judge for the sterilization of the patient was vacated and set aside because there had been no substantial compliance with the requirements of the statute. Laws providing for sterilization have been placed on the statute books of twenty-two States. The legislatures of other States have considered the subject, and at least two of them have

passed laws which were vetoed. Such laws in six States have been declared unconstitutional; two of these have since enacted new laws.

Enforced sterilization has been practised by many peoples, usually as a punishment for sexual offences, but it is only within the last twenty years that it has been given serious consideration by the American State legislatures as a eugenical measure. Some of the statutes are purely punitive, but most are eugenical and therapeutic, or purely eugenical. Those that are punitive apply only to criminals, and are usually confined to those who have been convicted three or more times of a felony, or those guilty of rape or other sexual crimes. The great majority of these laws apply only to inmates of State institutions, defectives and epileptics. The present Michigan statute even goes to the extent of including those mental defectives who would not be able to support and care for their children, and that part of the statute was declared unconstitutional in the case cited above as being an arbitrary and unreasonable classification. A few statutes include those inmates who have disease of a syphilitic nature, and some include sexual perverts. The more recent statutes are not limited to inmates of State institutions, but apply to all mental defectives found within the State. It is interesting to note, also, that in 1891 the Oregon legislature passed a law providing that a marriage licence would not be issued to anyone having communicable or contagious venereal disease or very low mentality, unless one or both of the couple are rendered sterile. Upon being referred to the voters, however, the law was disapproved.

The majority of the statutes provide for the operation of vasectomy on males or salpingectomy on females as the method of sterilization. Neither requires the removal of any organs or sex glands, and neither destroys sexual desires or capacity for sexual intercourse, but both render procreation impossible. Some statutes allow castration, and some specifically forbid it. The present Michigan statute is the only one to speak of treatment by X rays. Under some of the laws the written consent of the parents is necessary, but under the majority of them no consent is necessary. The advisability of passing such statutes has been seriously questioned. Since the great majority of the statutes are eugenical they are necessarily based upon two assumptions: (*a*) that feeble-mindedness, insanity, and criminal tendencies are inheritable; (*b*) that it is possible to determine in a particular case that children procreated by a certain defective will have such inherited tendencies. These are assumptions about which there is a difference of opinion. Though it has been stated that "biological science has definitely demonstrated that feeble-mindedness is hereditary," on the other hand it has been said that "there has always been some uncertainty in making a diagnostic distinction between native feeble-mindedness on the one hand and the acquired defect resulting in retardation on the other." Many scientists are dubious as to what will be the ultimate result of these sterilization statutes. It is contended that these laws open the door to other and greater evils; that since sterilization does not in the least interfere with the physical act of sexual intercourse there will be an increase of promiscuous sexual relations, and the effect would be exchanging the burden of feeble-mindedness for that of sex immorality and sex diseases.

Mental Disease in Relation to Eugenics.—This important subject is considered by A. F. Tredgold² in his Galton Lecture. It is pointed out that there can be no question that one thing which is urgently needed is the prevention of the propagation of those persons who suffer from any form of mental disease due to inheritance. For instance, the insane and mentally defective should certainly not be allowed to procreate. But there is no law to prevent anyone with a marked predisposition from marrying; there is no law to forbid him or her producing more children when discharged from an asylum during a

period of remission ; there is even no law to prevent the marriage of a mental defective, even though such person is by legal definition incapable of managing himself or his affairs, and is in need of care, supervision, and control. In the case of mental defectives, two methods for preventing propagation have been suggested, namely, sterilization and segregation. Tredgold considers that from all points of view, such as practicability, cost, the happiness of the defectives, and the effect upon the community of the release from care of persons who are incapable of caring for themselves, the advantages of segregation far outweigh those of sterilization. He realizes that there are many persons suffering from the milder grades of defect who are not themselves in need of institutional care, and in whose case the chief danger is propagation ; but even here he feels that there are abundant reasons against sterilization, and that if *ascertainment* were carried out, if every person not in an institution were placed under adequate supervision, and if the marriage of defectives were made illegal, the risk of propagation would become practically negligible.

Even if, as Tredgold observes, by sterilization, segregation, or supervision, we could prevent propagation by defectives, we should by no means eliminate mental defect or disease ; indeed, it is doubtful if we should produce any considerable effect at all ; for, in spite of the fact that according to Tredgold approximately 80 per cent of such cases are due to inheritance, the proportion who are the offspring of a mentally defective parent is a very small one. The great majority of defectives are produced by parents who have either been insane, or who have been carriers and not certifiable at all.

Every psychiatrist knows that many of the parents of his patients are such that if he had been asked to advise the latter before their marriage, he would assuredly not have 'forbidden the banns' or advised against having children. R. D. Clarkson³ makes this point evident in his Morison Lectures on mental deficiency. This writer ranges himself on the side of R. Huthcison, who, as a witness before the Royal Commission for the Care and Control of the Feeble-minded, expressed the opinion that mental deficiency occurs, as far as we can ascertain, purely accidentally, and may be regarded as analogous to deformities such as hare-lip or congenital club-foot. Clarkson states that as regards primary mental deficiency all his experience tends to confirm this view. Some of his cases seem to show that there is something in the theory of amphimixis, of incompatibility between the sperm and ovum so that their union cannot produce a normal individual. He cites the case of a hard-working, respectable, steady man, who had been married twice. He had a good family history, and the same is said to be true of both his wives. His first family are all normal and are all doing well, but his second consisted of four low-grade imbeciles, and one presumably 'normal' girl, who died of tuberculosis just after completing her training as a teacher. Clarkson knows a few other families in which mental deficiency and insanity appear with appalling frequency in two or three generations. The kind of insanity that appears most often is dementia præcox, and it is not impossible, he considers, that a form of this disease with that tendency for the mental disorder to appear earlier in each succeeding generation, which Mott has shown to characterize dementia præcox, may account for these cases. He finds them, however, quite exceptional. He has seen and talked with the parents of over a thousand defective children, and the number of them he would have certified could be counted on his fingers. He states, furthermore, that the striking fact about the parents of many defectives is their high intelligence, and especially the fine character of so many of the mothers. It almost seems as if the sorrow and distress of having given birth to a defective brought out many of the highest qualities of human nature.

Another interesting question touched upon by Clarkson is the fertility of feeble-minded persons. He considers that there is little evidence for the opinion widely held that mental defectives are more fertile than normal people. In this connection he quotes Fernald, one of the ablest workers for the mentally defective in America, who traced 1537 cases that had been discharged, in spite of his protests, from his institution in twenty-five years. Of these, 279 had disappeared leaving no trace, and 612 had been transferred to other institutions, leaving 646 of whom a history of life in the community was obtained. Of these 646 there were 470 men and 176 women. Twenty-seven women had married and had had 50 children; 33 of these were living and were all seen and found to be normal; the rest had died; 7 of these married women had no children. It is interesting to note that nearly all the women had married above themselves in the social scale. There were 11 unmarried mothers, 8 being morous and 3 imbeciles. They had 13 illegitimate children, all of whom were apparently normal. Only 13 of the men had married, and they had 12 children; 6 had no children, 1 had three, 3 had two, and 3 had one child each. None of the children were defective.

There is no evidence of abnormal fertility from Fernald's statistics, and Clarkson states that his small experience entirely confirms this. That the offspring of defectives mated with normal people should be normal is, of course, to be expected if there is any truth in the Mendelian inheritance of mental defect; but trouble may be expected in the next generation. Clarkson has seen very few grandchildren of defectives, and those he has seen were very young; but so far as he could judge they were not defective. The conclusions to which he has come as to causation are stated shortly thus: (1) Mental deficiency is usually 'spontaneous' in origin: in other words, we know nothing about how it is produced in the great majority of cases. (2) There is grave doubt as to the existence of the neuropathic diathesis. (3) There is no evidence that mental deficiency or neuropathic diathesis is transmitted according to Mendelian laws. (4) The mentally defective are not exceptionally prolific. The writer concludes with a quotation from Jennings with which he expresses his entire agreement: "So long as bi-parental inheritance is kept up, the variety, the surprises, the perplexities, the melodrama that now present themselves among the fruits of the human vine will continue. Capitalists will continue to produce artists, socialists, and labourers; labouring men will give birth to capitalists, to philosophers, to men of science; fools will produce wise men, and wise men will produce fools; who mounts will fall, who falls will mount, and all the mass of problems presented to society by turns of the invisible wheel will remain."

Mongolian Idiocy.—A. G. Mitchell and H. F. Downing⁴ record a case in which Mongolism occurred in one of twins whose sex was identical. The father and mother of the patient were living and well, the former being 30 years of age and the latter 27. One sister of the patient, whose age was 5 years, was living and well and had no characteristics of Mongolism. The mother had had no miscarriages, and there was no history suggestive of syphilis. The birth of the twins was uneventful. Two placentas and two complete membranes were present. The patient was first seen when he was two months of age, at a time when the Mongolian facies was quite evident. The twin brother was not a Mongol and continued to develop normally both physically and mentally. At fourteen months of age the patient died of laryngeal diphtheria. The somewhat slanting and narrow palpebral fissure, the well-developed inner epicanthic folds, the wide space between the eyes, the small mouth with protruding tongue, the spadelike trident hand, and the brachycephalic head are all well seen in the illustrations accompanying the paper. A picture of the

twins taken at the age of one year shows the differences in the appearance of the two babies.

The writers give the following summary of their paper: Including the present case, there have been 24 instances of Mongolism reported in twins. In 15 of these the condition was present in only one of the children; the other and normal twin was of the opposite sex in 11 cases, the sex not being stated in the remaining 4. In 6 cases Mongolism occurred in one of the twins of the same sex, in 4 of which there were two placentas present at birth; in the other 2 the condition of the placenta was not stated. These facts are in favour of the theory of Mongolism being a germ-plasm defect, and are against any theory which holds that causes during pregnancy are at fault. In no case has it been demonstrated that Mongolism can occur in one of twins the result of a single-ovum pregnancy. If such a condition of affairs could be shown to exist it would be against the theory of germ-plasm defect, even though it would not prove any theory dependent upon the assumption that the etiological factor is operative during pregnancy.

REFERENCES.—¹*Jour. Ment. Sci.* 1926, July, 386 (abstr. in *Medico-Legal Jour.* 1926, Jan.-Feb.); ²*Eugenics Review*, 1927, xix, 1; ³*Edin. Med. Jour.* 1927, Feb., 61; ⁴*Amer. Jour. Med. Sci.* 1926, Dec., 866.

MENTAL DISEASES.

Henry Devine, M.D., F.R.C.P.

CLINICAL PSYCHIATRY.

Mental Changes in Encephalitis Lethargica.—Writing on this subject, F. C. Shrubbsall¹ shows that the intellect may be affected in a greater or lesser degree ranging from mental hebétude to imbecility. In quite young children mental growth may be altogether checked, though this is by no means always the case. Periods of irritability may alternate with the hebétude. The symptoms of cerebral damage include: narrowing and weakening of mental capacity; weakening of power of attention, and hence impairment of memory for recent events; retardation of mental processes; mental apathy; impairment of inhibitions, especially of instinctive processes. The patient is often conscious of his inability 'to keep his mind on anything', and the rapid onset of fatigue and inattention can be noticed in applying intelligence tests. Many children do well on tests that can be done rapidly, but fail at those requiring concentration. In many cases the failure seems to be due to lack of interest. When the initial obstacle to wandering attention is surmounted, it is frequently found that the responses to intelligence tests are less poor than would at first appear. Longer periods of time must be allowed for answers, and often then the working of subjects may be such that the answer to a test previously failed or left incomplete will be given in the course of some subsequent test. If a strict method of time limit is employed, the mental age would appear much lower than is really the case.

R. M. Marshall² states that what the psychologist calls *general intelligence* is not affected by the disorder to any appreciable extent. He finds that the recognized mental tests show that the apparent precocity of the restless, naughty child is not accompanied by a high intelligence quotient; that, on the other hand, it is quite exceptional for one of these children to have an intelligence quotient below 85; and that nothing in the nature of a secondary dementia is ever seen, even when the disorder has lasted so long as nine years. Such a view more or less coincides with that of Shrubbsall, though the latter has found a definite retardation in the rate of mental growth, particularly in the case of those who have been attacked in pre-school years, many of whom become definitely mentally deficient.

As regards the mental state of the post-encephalitic 'restless, naughty child', Marshall does not consider this reaction to be the expression of an absence, a numbing, or a perversion of the 'moral sense'. He emphasizes the *maniacal* character of his misbehaviour, this having more affinity with that of the maniac than with that of the delinquent, hebephrenic, or that *rara avis*, the moral imbecile. There is nothing cunning or underhand about the misdemeanours of the restless, naughty encephalitic child. Unlike the delinquent, he does not choose a convenient season in which to commit his misdeeds; he carries them out in the public eye. He acts on the spur of the moment, and his offences are quite devoid of *malice prepense*. Most of the outrageous incidents in which he figures arise from injudicious handling. In short, there is any amount of instability, but little or no evidence of moral depravity. All their mental processes are unduly mutable; incidental and non-essential ideas, aroused by habit of speech or similarity of sound, break into their talk, giving it a smack of precocity. On the other hand, their restlessness is far from aimless; it is really a press of occupation. They are always busy about something, and as long as their activities are confined to useful channels they work well under supervision. Marshall thus considers the 'restless, naughty child' is suffering from psychomotor excitement, and that it is similar to that which may occur in the course of an attack of mania of the manic-depressive type. They are a sort of 'Peter Pan'—they never grow up.

These views as to the nature of the conduct disorders in these cases coincide in a large measure with those of Shrubsall, who states that the effect of encephalitis is to increase the irritability of the subject and to diminish the powers of self-control. Older persons have expressed themselves as unable to withstand minor worries or overlook events which they formerly took as matters of course, and this leads to difficulties in many homes. The relative frequency of the sequelæ is shown by the following: 214 cases of children under 16 were investigated during 1926. Of these, 78 were apparently normal and showed no sequelæ, and 20, though showing no specific after-effects, were clearly not so well as they were before their illness. The remainder are classified as follows: Disturbances of sleep, 41; Parkinsonism, 10; excitomotor changes, 20; various paralyses, 28; reduction of intelligence, 56; conduct disturbances, 70. Classifying the predominant disturbances of conduct a little further, it appeared that there were irritability, morbidness, restlessness, and excitability in 45; lack of control in 26; evidence of conversion neurosis in 4; pilfering in 18; and sexual assaults in 2. The most marked feature is, then, a general morbid restlessness rather than serious demoralization; but it is difficult to draw the line between the two. Shrubsall points out that a similar temporary increase of irritability, diminution in power of attention, and lowering of the mental age or check in educational and intellectual progress, has been noted in the closely allied rheumatic form of encephalitis known as chorea, which also for a long time may present physical residuals in the form of tics and jerky movements. Fortunately in this the recovery-rate is high, and with rest from pressure the retardation is not of long duration, though it may extend to the end of school life. In encephalitis lethargica, if sequelæ have persisted for as long as two years the prognosis for ultimate recovery is very poor.

The treatment of these cases must be largely psychological, and most observers take the view that the conduct disorders are in a measure reactive to injudicious treatment received by the children subsequent to their illness. The parents of a child recovering from the acute stages of an illness, Shrubsall observes, are apt to do too much. Frequently they may laugh and draw attention to minor phases of petulance, but later get tired of the slowness of convalescence and may punish the child severely for pursuing the same

conduct which had previously been received by signs of amusement and toleration. The child quickly notes the difference in treatment, and on the basis of increased irritability there is built up a structure of neurosis.

C. P. Clark³ discusses the possibility of dealing with these patients from the psycho-analytic method of approach. He reports upon trial-and-error efforts undertaken by social agencies to adapt these patients to the rigid and limited provisions of a modern community; discusses the intensive training of a typical case in a young girl whose symptoms were radically improved after a period of ten months' psycho-analytic re-education in an observation home; gives a partially analysed case, with suggestions for future care that might be undertaken with a more profound interpretation of the patient's emotional needs; and finally, proposes a plan for organizing an observation home for the intensive study and training of a group of cases. (*See also* ENCEPHALITIS, EPIDEMIC.)

Syphilis and Insanity.—S. E. Jones⁴ gives an analysis of the etiological relationships of syphilis to the psychoses based on the admissions to the Mental Hospital, Callan Park, Sydney, for the period 1910-20. The writer states that since the introduction of the Wassermann technique to Australia by F. Flashman it has been a routine procedure to examine the sera of all patients admitted to the mental hospitals. The present analysis is based on the correlation of these examinations with clinical diagnoses over a period of ten years. The response to the Wassermann test is accepted as sufficient evidence of previous syphilitic infection. The total admissions to Callan Park for the period mentioned were 2573 males and 2053 females, a total of 4626. A response of serum or cerebrospinal fluid to the Wassermann test or undoubted clinical evidence of syphilis was found in 575 males and 219 females, a total of 794, or percentages of 22.3, 10.5, and 17.1. In 15 per cent of males, 2.6 per cent of females, and 10 per cent of the total number of patients admitted, syphilis was primarily and directly responsible for the insanity. It is probable that syphilis played at least a secondary rôle in a proportion of the other cases. The characteristic psychological feature of syphilis of the nervous system is dementia. The writer states that there is reason to believe that the action of syphilis on the nervous system is toxic as well as degenerative.

A similar investigation to the above has been carried out by H. F. Watson,⁵ who made systematic serum tests on 290 patients in the Manx Mental Hospital, and 388 in the Bute Mental Hospital. In the first group, 46 gave positive results—23 men and 23 women; 241 were negative—117 men and 124 women; while the cases of 1 man and 2 women were positive with the flocculation tests and negative with the Wassermann reaction. The male patients gave positive results in 16.81 per cent and the female in 15.43 per cent. In the second group, of the 185 men and 203 women, 39 of the former and 33 of the latter gave positive results; 139 men and 169 women gave negative results, while the case of one woman was positive with the flocculation test and negative with the Wassermann reaction. The male patients gave positive results in 21.08 per cent, and the women in 16.25 per cent. The writer concludes that the flocculation test, if not superior to the Wassermann reaction, has been proved in the series of cases studied to be in no way inferior, and its application is much simpler. The investigation suggests that while syphilis in mental hospitals is more common among men than women, there is not such a wide difference as was at one time supposed. By means of laboratory methods it can be demonstrated that the incidence of syphilitic infection is much greater than has been suspected. The percentage has been raised by 12.1 in the case of the Manx patients and by 15 for the Bute Hospital.

G. A. Lilley⁶ records that in a series of 412 cases admitted to Hanwell Mental Hospital between Dec. 20, 1923, and Dec. 20, 1925, the blood-serum was tested,

and of these, 105 or 25.48 per cent were found to be positive. This shows the distinctly high incidence of syphilis of 1 in every 4 admissions.

R. M. Clark⁷ writes on the *Meinicke micro-reaction for syphilis for use in a mental hospital*, giving his own experiences of this test. This is the Meinicke reaction for the serodiagnosis of syphilis improved and adapted to a microscopic slide test. It is simple, ready, and accurate, and is found especially useful in the insane, in children, in obese persons, or those with small veins; where only small quantities of serum are available; and in emergencies when a diagnosis cannot be delayed. Large numbers can be dealt with in a short time, and it is an excellent test in a mental hospital and for the routine examination of admission. In 1925 Meinicke improved and simplified Dohnal's method, and, after comparison with the Wassermann reaction in 2000 sera, satisfied himself that the methods were of equal value for the detection of syphilis. The paper includes an excellent account of the technique of the test.

SOCIAL PSYCHIATRY.

The Induction of Abortion.—J. R. Lord⁸ introduces an interesting problem in reference to the induction of abortion in the treatment and prophylaxis of mental disorder. As regards physical diseases associated with pregnancy the legal position has been stated on good authority to be as follows: (1) The law does not forbid the induction of abortion during pregnancy, if such is to save the life of the mother: some authorities add, "if such is likely to result in temporary or permanent ill health of the mother." Ill health, so Lord feels, should, and may now for that matter, include both physical and mental health. (2) All acts are lawful which are done in the course of proper treatment and in the interests of life of the patient. (3) Mr. Justice Salter has pointed out the law, in speaking of the unlawful use of instruments and drugs for such a purpose. Speaking broadly the law never justifies abortion. There is no such thing as justifiable abortion in the law. The law is blind, and has nothing to do with abortion when undertaken for medical reasons only. How long or how far the law is going to remain blind to abortion for eugenic, economic, and emotional reasons time alone will show. The only morally sound reasons for inducing abortion are medical. These are to preserve life; to alleviate or cure serious physical or mental illness; or to prevent serious ill-health, physical or mental, whether temporary or permanent. As regards the first the psychiatrist is on safe ground, but it is doubtful if he has sufficient facts to justify abortion for curing or alleviating a psychosis. It is also questionable if there are sufficient grounds to justify the risks of abortion in a case of early pregnancy, say, with a psychopathic heredity and signs of mental instability. Where there have been previous attacks, Lord thinks it is difficult to say the induction of abortion is not justifiable, for does not the psychiatrist imply this when he advises against future pregnancies in the case of many women patients discharged recovered from a psychosis associated with child-bearing, or even not so associated?

In the discussion on this problem W. A. Duncan said that in only two cases of insanity had he found it necessary to induce abortion. One was a case of eclampsia, and the other a severe case of chorea: In the latter the chorea cleared up afterwards. A. N. Boycott considered that the question of inducing abortion in cases of insanity or threatened insanity should be dealt with in the same way as it would be in diseases in which it was recognized that the inducing of abortion would probably save the life of the patient. These include vomiting of pregnancy, chorea, albuminuria, eclampsia, cancer of the cervix, and contracted pelvis. It was possible in some acute cases of insanity for the condition of the patient to be so critical that it might be considered

that the induction of abortion would save her life. As regards the question of inducing abortion in cases of insanity where the bodily condition of the patient was fairly good, or in cases in which it was feared by the patient or her relatives that insanity was threatened, it did not appear that it would be justifiable to induce abortion upon a mere supposition that it would cure or alleviate the insanity or obviate the threatened insanity. E. Mapother stated that he had never known a case of severe psychosis where the induction of abortion was seriously considered for the purpose either of saving life or terminating the mental symptoms. He had seen no cases where induction of abortion was performed merely on account of the occurrence of a previous attack and the possibility of a recurrence. Recently, however, the question was raised in the case of a patient who had been a voluntary boarder in a mental hospital in a previous attack. She was pregnant at that time, developed an obsessional state, which had persisted practically unchanged throughout that pregnancy, into an existing pregnancy when she was seen. There seemed to be no such probability of an exacerbation as would justify interference. Personal views concerning the ethical aspects of abortion were entirely independent of those which one held as a psychiatrist, while the law remained in its present condition.

R. C. Turnbull said that two cases had been brought to his notice in which it was proposed to induce abortion in order to prevent an attack of insanity at childbirth. In both cases he gave an opinion that the induction of abortion was not justifiable, and in both cases labour had taken place under normal conditions without any undue mental disturbance. He had knowledge of a case of acute anxiety melancholia associated with pregnancy where abortion had been induced in the hope that the operation would prevent the certification of the patient; but in spite of that operation, certification was necessary. The patient's mental condition, instead of being improved, became definitely more acute, with the development of delusions of unworthiness connected with the nature of the operation performed. A. H. Boyle remarked that two difficulties met one in regard to the induction of abortion as a preventive measure in patients who had attacks of insanity connected with one or more previous pregnancies. Firstly, that abortion was in itself a disturbing event, and might be followed by mental trouble as at delivery at full term and for much the same reasons. Secondly, there was in many cases a definite mental conflict aroused by the interference with pregnancy, most women having a feeling of guilt in regard to it, even though they have greatly desired it to be done. In concluding the discussion, Lord said that it was evident that the weight of evidence told definitely against the growing practice of inducing abortion for the prevention of mental disorders, and that those practitioners who favoured it might be unwittingly doing harm to the social organism. Fears of exposure, shame, depression, even misery following the breaking of the moral law should not be confused with the symptoms arising from the disordered mind; such were reactions of the normal mind.

PROGNOSIS.

One of the most difficult tasks with which the psychiatrist is faced is that of assigning a prognosis to early and acute psychoses of the biogenetic type. One fact is now generally recognized, namely, that the prognosis of acute schizophrenic states is not so unfavourable as the earlier formulations of Kraepelin on *dementia præcox* would seem to imply. A few years ago H. Devine⁹ made some observations on the psychogenetic psychoses in which it was pointed out that the more a psychosis was clearly associated with a definite exogenous stress, the more favourable were the prospects of recovery. The

subsequent history of one of the cases referred to was interesting in this connection. It was that of a woman who had for many years devoted her whole life to her mother. When the latter died, her daughter fell into a severe psychosis with delusions of negation. The psychosis was thus reactive to the loss of a beloved object. The psychosis lasted for two years, and then the patient recovered, and a normal state of biopsychic equilibrium was re-established. The stress in such cases need not be psychological, for the same generalization obtains where physical trauma is concerned. We know, for instance, that a febrile delirium is usually favourable in outcome.

K. H. Menniger¹⁰ has written an important article on *influenza and schizophrenia* in which he gives an analysis of post-influenzal dementia præcox as in 1918 and five years later. There are three outstanding features in the analysis made of the data pertaining to post-influenza psychoses: schizophrenia was relatively the most frequent psychiatric syndrome; it occurred with and without evidence of hereditary predisposition; most of the cases so diagnosed made more or less complete recoveries. If we retain the Kraepelinian conceptions of dementia præcox, we must suppose that influenza precipitated many cases which seemed in the acute phases to be dementia præcox, but of which relatively few ultimately verified this early diagnosis, and were somatic or cyclothymic psychoses of strongly schizophrenoid colouring. For those who reject Kraepelin's conception in favour of a schizophrenic syndrome, representing certain phases of psychic disintegration arising upon varied bases and following varied courses, the conclusions from the influenza series would be that many such schizophrenic syndromes occurred immediately subsequent to influenza; but of the entire series the great majority of cases with dementia-præcox-like features and associated with a definite infection were benign psychoses and eventually cleared up.

J. Lange,¹¹ in a paper on the question of the schizophrenic reaction type, observes that Kraepelin's distinction of the manic-depressive and schizophrenic groups was based not only on clinical manifestations but also on ultimate outcome, the one tending to recover, and the other, even if showing remissions, tending to a progressive deterioration of the personality. Where it was found that psychoses of apparently schizophrenic type resulted in complete and lasting recovery, these came to be regarded as unusual forms of other types of psychosis. Kraepelin later spoke of a double set of tendencies: on the one hand, some individuals have a certain predisposition to a particular set of symptom forms which tend to manifest themselves when provoked by any of a variety of causes; while, on the other hand, different disease processes show a tendency to produce certain forms of manifestation in symptoms. Thus in any particular case both factors are at work: a manic-depressive attack may take on schizophrenic forms in a patient with a constitutional disposition of a schizoid type.

During the war Popper drew attention to what he called the schizophrenic reaction type—cases of psychogenetic origin which made complete recovery after a phase of a definitely schizophrenic type. The significance of such cases is still a matter of dispute, and therefore Lange gives instances of two in which the psychosis was definitely a reaction to emotional stress which entered into the content of the psychosis, and recovery was complete, with insight and full memory; confusion was absent. Neither could be regarded as merely hysterical, the symptom of the will being influenced so that all sorts of queer actions were compelled, and the presence of unsystematized delusions being suggestive of a schizophrenic or paraphrenic psychosis. At the height of the psychosis this would undoubtedly have been the diagnosis made.

In a contribution on prognosis in schizophrenia, E. A. Stecker and G. F.

Wiley¹² conclude that if the precipitating situation is innately significant and the psychotic content reflects its component factors, then the psychosis may be benign even though the symptoms in themselves have a somewhat sinister aspect. The transition from sanity to mental disease is an extremely critical period. Inhibition is lessened, and extraneous accidental happenings may be deeply impressed and later elaborated into apparently malignant symptoms. Other things being equal, an acute stormy onset is a favourable sign. An affective display which is markedly at variance with the remainder of the psychotic content, or a notable insufficiency of affect, ordinarily constitutes a criterion of chronicity. It is important to distinguish between the psychosis in which the emotional disharmony or paucity results from the unfolding of a fundamental disease process, and the one in which the apparent lack of alinement and emotional inadequacy are determined by independent factors not concerned with the basic mechanism of the psychosis. Toxicity or exhaustion may complicate a benign psychosis and impart to it a deteriorating guise. Both the pre-psychotic life and the psychosis should be carefully scrutinized for evidence of infection or bodily depletion. Catatonia is not peculiar to dementia præcox. It may be a response to toxicity, and it then admits of a hopeful prognosis. Stupor, in itself, does not furnish a safe prognostic indicator, and it must always be considered in its relations to the entire psychosis. When the psychosis as a total reaction constitutes an escape and psychotic correction of serious circumstances in life which have brought the patient to an impasse, then the prognosis may be favourable even though the clinical aspects are not promising. Careful study, not only of the actual mental symptoms, but of all the antecedent factors which may have been influential in moulding or complicating the expression of the psychosis, and their proper evaluation, should tend to reduce the margin of prognostic error.

TREATMENT.

Removal of Chronic Sepsis.—Though this subject has been considered in previous issues of the *MEDICAL ANNUAL*, we do not feel that an excuse is needed for reverting to it again. The chief aim of the psychiatrist is to cure his patients, and there is no doubt that in quite a number of cases the removal of foci of infection in psychotics is followed by a restoration of their mental health. The writer himself has often observed such happy results, and is in agreement with those who maintain that the search for and the treatment of septic foci should be a matter of routine in the psychoses. G. French¹³ has emphasized the importance of nasal-sinus infection in this connection, and gives an account of two cases (one of which was known to the writer) in which drainage of the nasal sinuses was followed by mental recovery. Eleven similar cases are cited from the literature. The distribution of the sepsis in the sinuses of these patients is thus summarized:—

Maxillary antrum	{ Unilateral	8 cases	Ethmoidal sinus	{ Unilateral	9 cases
	{ Bilateral	2 "		{ Bilateral	4 "
Frontal sinus	{ Unilateral	4 "	Sphenoidal sinus	{ Unilateral	3 "
	{ Bilateral	3 "		{ Bilateral	2 "

In many of the cases more than one sinus was involved, and in all recovery was reported as following drainage.

In approaching this problem it is essential to remember that a psychosis is not due to isolated or independent causes. It is due to a complex of mutually interrelated factors, amongst which are the state of the organism, the whole of the past history of the patient, both mental and physical, and also the ancestral history. Thus it is obviously incorrect to say that a psychosis is

'due' to a focus of infection, since many individuals with a similar condition are in an entirely normal state. There must clearly be other factors at work. All that we can say is that there is some relationship between focal sepsis and some cases of mental disorder. Furthermore, the reaction of different individuals to the same morbid agent is extremely variable; focal sepsis, for instance, may be an important factor in the causation of such diseases as rheumatism and pernicious anæmia. As Moynihan observed at the annual meeting of the British Medical Association in 1927,¹⁴ we desire to learn something of the peculiar circumstances in which a very prevalent disorder, oral sepsis, is sometimes able to exert the gravest influence, and at other times seems inert even though present in an advanced stage. The same speaker referred to a number of cases upon which he had operated and in which psychoses had cleared up following surgical treatment. W. Hunter, whose investigations upon the relationship of focal sepsis to medical diseases have exerted a definite influence upon modern medicine, in the paper with which he opened this discussion, expressed the view that the incidence of chronic sepsis among the insane of this country was much higher than in any group of hospital patients. He stresses the importance of the early dental history in cases of manic-depressive insanity and dementia præcox, and observes that he has had cases in which he has been able to trace back a continual history of severe dental infection from the time of dentition at the age of 2 onwards. How far this early dental infection is actually responsible for the development of a psychosis in later years it is, of course, difficult to say. There would appear to be some fundamental biological inadequacy in a child whose teeth were thus affected so early in life. Hunter points out that the incidence and sites of the focal sepsis found in mental disorders are well brought out in the following table of 200 cases treated successfully by Cotton, and found afterwards on visit to have remained well :—

INCIDENCE AND SITES OF FOCAL SEPSIS TREATED SUCCESSFULLY IN
100 MALE AND 100 FEMALE PATIENTS.

MENTAL DISORDER	TOTAL		TEETH		TONSILS		GASTRIC		VACCINE		VESICULO- TOMY	CERVIX	COLON	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Manic-depressive insanity ..	49	66	49	66	39	47	41	50	41	46	1	8	—	9
Dementia præcox ..	18	8	18	8	13	7	13	7	13	7	—	5	—	2
Paranoid condition ..	15	9	15	9	11	6	14	5	14	5	1	1	1	1
Psycho-neurosis ..	7	10	7	10	7	6	6	7	6	6	—	2	—	—
Toxic psychosis ..	11	7	11	7	6	7	9	7	10	7	—	4	—	1
Totals ..	100	100	100	100	76	73	83	76	84	71	2	20	1	13

In the case of men the teeth were found infected in all cases and in every form of psychosis, the tonsils in 76 per cent of cases, the stomach in 83 per cent (all of them requiring treatment with vaccines), the seminal vesicles in 2 per cent, and serious lesions of the colon in 10 per cent. In the case of women the teeth were found septic in all cases, the tonsils in 73 per cent, the stomach in 76 per cent (requiring treatment with vaccines in 71 per cent), the cervix in 20 per cent, and serious lesions of the colon in about 13 per cent of the cases. As regards the incidence in different forms of psychosis there was little or no

difference between them in the case of males, but in women the colon was operated on in 13 per cent of cases, as compared with only 1 per cent in males, 9 of the cases being among 66 cases of manic-depressive insanity.

Interesting data regarding the incidence and seats of focal sepsis are also supplied by Graves :—

NO. OF CASES	TEETH	TONSILS	NOSE	EAR	CERVIX
296	230	—	—	—	—
258	193	—	—	—	—
123	—	48	18	39	—
249	—	104	20	106	—
139	—	—	—	—	99

These figures yield the following incidence of septic foci in different seats :—

Oral sepsis	.. 76 per cent	Ear	.. 39 per cent
Tonsillar sepsis	.. 40 „	Cervix uteri	.. 71 „
Nasal sinusitis	.. 10 „		

The figures show the widespread character of the sepsis present in the mental patient.

In concluding his paper, Hunter pleads for an early removal of any septic focus so as to prevent permanent and irreparable damage, and that, in order to achieve this new era of antisepsis and the cure of 'septic psychoses'—a term approved by W. A. Potts—each mental hospital should be as fully equipped for surgical and specialist work as it has hitherto been for medical nursing care.

An interesting question is raised by T. C. Graves¹⁵ as to the possible relationship between chronic infections in the parents and psychopathic tendencies in the offspring. Many psychiatrists are of the opinion that psychopathic heredity is the outcome of chronic intoxications in the ancestry. According to such a view, a pathogenic agent which originally manifests itself physically in the ascendant may determine in the descendant a vitiation of the vital processes of the organism upon which the development of personality depends. The organism in general, and the brain in particular, are invaded by a humoral or nutritive disorder, more obscure and less evident than the state of the organism from which it is derived by heredity, but more diffuse and more tardy in its effects, and more serious since it manifests itself in disturbances of the psychic functions. This theory of *blastophoria* or germinal injury has been considered more especially from the standpoints of syphilis, tuberculosis, and alcohol; but there is no reason why chronic focal infections should not exert an injurious effect upon the germ-plasm, since these are now known to be closely concerned with the development of disease and to exert a profound influence upon the health of the organism. We cannot erect a hypothesis upon an isolated case, but the one described by Graves is interesting in the connection. The following is a brief account of his case :—

The patient was a single woman, age 21, the fifth and youngest child of a mother 44 years of age. The mother had three 'nervous breakdowns', but was not certified and was now a mental and physical invalid. Two brothers and one sister had suffered from chronic nasal disease. The patient had had chronic otitis media since the age of 3. She was a quiet reserved girl, never on the alert. Menstruation was irregular until a mastoidectomy was performed at the age of 19, when it became regular. After the operation she became depressed, with persecution and suicidal obsessions; she improved for a time, and then grew noisy, restless, exalted, hallucinated, and confused, with catatonic manifestations. The face was covered by a scattered staphylococcal eruption: the tonsils were septic, there was pus in the right nostril, the left antrum was darker than the right, and there was a mucopurulent cervical discharge. The serum was negative to typhoid, paratyphoid A and B, *B. acitrycke*, to Shiga's bacillus.

and to Flexner's Y bacillus, but agglutinated Gaertner's bacillus. Eight intravenous injections of T.A.B. vaccine were followed by a rise in the titre of the serum to all the above except paratyphoid B, and by considerable clinical improvement, although she remained depressed. A sinus examination then showed pus in the left sphenoidal sinus and both antra. The antra were washed out, and this was followed by an exacerbation of the skin eruption. A second wash-out was followed by much improvement in the latter. The brain membrane permeability value returned to normal. Another course of non-specific protein therapy was then given, and ultra-violet light treatment was instituted. Intranasal drainage of both antra was performed. The patient was now well and was reported to be alert as never before.

Graves points out that in this case definite heredity can be traced. The patient developed mental disorder and became certifiable at an age earlier than that at which it was exhibited in the parent, thus fulfilling the 'law of anticipation'. These facts, together with the progressive nature of the symptoms culminating in a catatonic confused state, suggest a bad prognosis. Nevertheless substantial recovery occurred after treatment of septic foci. Graves suggests that we are therefore justified in considering psychotic heredity as being in part, if not wholly, made up of other components. In this case chronic sepsis was present in the mother and in the younger members of the family as well as the patient, and for this reason Graves suggests the term 'septic heredity', which connotes the effect of the maternal toxæmia upon the child in utero, and possibly offers a more hopeful prospect. Familial germinal infection would also seem highly probable in such a case. Another point of interest in this case is the use of non-specific protein therapy in addition to the surgical treatment of the septic foci. As Bruce pointed out, the bacterial toxæmias of insanity are chronic, and indicate that the real disease lies deeper than mere toxæmia, the disease being rather a failure of the organism to form antibodies. Non-specific protein therapy may thus supply the necessary stimulus to the organism to enable it to react to the chronic toxæmia.

Drug Treatment.—Reference was made in the MEDICAL ANNUAL, 1926, p. 257, to the use of *Somnifen* in the psychoses. In England this new drug was first tried in 1924 at the Maudsley Hospital. The results of this treatment are recorded by W. S. Dawson and M. R. Barkas.¹⁶ Klasi, who first gave the drug a trial, emphasizes that it should be used strictly according to his method—namely, giving at first an injection of Morphine $\frac{1}{4}$ gr. and Hyoscine $\frac{1}{100}$ gr., followed in half an hour by two ampoules each containing 2 c.c. of somnifen solution. The injection must be deeply into the muscles if not given intravenously, as subcutaneous injection produces sloughing. After this a twilight sleep must be maintained by doses of one ampoule at intervals, usually of six to eight hours. The treatment is best carried out in a darkened room; fluid diet, attention to excretion, and careful watching of the pulse are needed, and the patient can be aroused for attention and will doze off again. If he be allowed to become fully awake the treatment must be restarted. It must be stopped if vomiting or cardiac failure occur, or during menstruation. The cases treated are divided into (a) those given the full course, being kept in a twilight sleep state for five days or more, (b) those started in this way and stopped for some reason, (c) those treated otherwise. Eighteen cases in all were treated. The results were not particularly encouraging. The writers state that in most cases where the treatment can be continued a twilight sleep can be maintained; that any improvement following this treatment is quite transitory, there being no change at all in some cases; that there are considerable risks attached to the use of somnifen, as in many instances the pulse becomes progressively weak, rapid, and often irregular. Only one case had retention of urine and cystitis. The improved contact with the environment claimed by Klasi was not conspicuous, a few cases showing it only for a few days and then

relapsing. They consider that sonnifen, as a soluble sedative which can be given intramuscularly, has its place in the list of available sedatives for psychotic patients, but that it has considerable risks and no special advantages. If twilight sleep is of benefit in some cases—and this was not evident in these cases—the writers feel that it should be produced where desirable by means of combinations of hypnotics rather than by sonnifen.

Berkeley-Hill¹⁷ records the results of the treatment of three psychotic patients in the Ranchi European Mental Hospital by sonnifen. The results on the whole were not particularly gratifying, except in one case in which a remarkable confirmation was obtained of the suspicions that had been formed as to the main causal factor of the disorder. This was a case of obsessional neurosis, and, under the influence of the drug, facts were elicited which could not otherwise have been obtained from the history. Only one of the patients showed any untoward symptom during his treatment. The temperature on the third day rose to 104°, and there were signs of collapse. The injections were stopped, the temperature fell the following day, and the treatment was continued. The first case was treated for 10 days and slept for 160 hours; the second for 11 days and slept for 178 hours; and the third for about eight days and slept for 130 hours.

W. W. Dodel¹⁸ reports on the treatment of schizophrenic disorders with Calcium. He has treated 14 cases with intravenous injections of 'Afenil', the calcium preparation of Knoll; he gives 10 c.c. every two or three days in a series of 30 injections. His most striking successes were with four cases of periodic acute catatonic excitement, in which there had been regular prolonged attacks of excitement for seven to ten months. In all four the excited periods either ceased or were very greatly diminished in severity: one patient has now been free for five months, having regained insight and capacity for normal activities and interests, while the others have shown similar improvement for three months; in all cases the remaining autistic characteristics of the intervals improved equally after the afenil. All the patients seemed to appreciate the improvements, and, while usually objecting to the first injections, later co-operated and even asked for them. It is too soon to judge how far any improvement has occurred in these, but the author's impression is that on the whole the treatment does seem to tend to remove or render latent whatever processes underlie the acute development of schizophrenia, and he recommends its trial in all early cases, as being generally beneficial and possibly curative in its effects.

REFERENCES.—¹*Brit. Jour. Psychol. (Med. Sect.)*, 1927, vii, 221; ²*Jour. Ment. Sci.* 1927, Oct., 589; ³*Med. Jour. and Record*, 1926, cxxiii, 595; ⁴*Med. Jour. of Australia*, 1926, Oct., 441; ⁵*Jour. Ment. Sci.* 1926, Oct., 573; ⁶*Ibid.* 1927, Jan., 108; ⁷*Ibid.* 1926, Oct., 588; ⁸*Ibid.* 1927, July, 390; ⁹*Proc. Roy. Soc. Med. (Psychiat. Sect.)*, 1920, xiii, 1; ¹⁰*Amer. Jour. Psychiat.* 1926, v, 469; ¹¹*Munch. med. Woch.* 1926, 28, 1152; ¹²*Jour. Ment. Sci.* 1927, Jan., 9; ¹³*Lancet*, 1927, ii, 13; ¹⁴*Brit. Med. Jour.* 1927, ii, 811; ¹⁵*Jour. Ment. Sci.* 1927, Oct., 563; ¹⁶*Lancet*, 1926, ii, 1155; ¹⁷*Ind. Med. Gaz.* 1926, lxi, 383; ¹⁸*Munch. med. Woch.* 1925, 1462 (epit. *Jour. Neurol. and Psychopathol.* 1926, Oct., 185).

MESENTERIC CYSTS.

A. Rendle Short, M.D., F.R.C.S.

M. Cornioley¹ contributes a very informing study of this uncommon condition. Two cases came under his care, both in middle-aged women. Both were removed, and the patients did well. Cysts may be retroperitoneal or truly mesenteric. Their origin may be: (1) Lymphatic vessels, by retention—chylous, serous, bloody, or purulent; (2) Lymphatic glandular, showing the same four varieties; (3) Lymphangiomas, also same four varieties; (4) Congenital cysts, dermoids, or entodermoids; (5) Dermoid cysts, teratomatous or mixed; (6) Enterocystomata; (7) Parasitic. The enterocystomata are due to nipping off of a portion of primitive intestine, with subsequent cyst

formation, and are generally seen in infants. The lymphatic cysts are most often seen in women. Of Cornioley's cases, one was an enterocystoma and the other a chyliangioma, i.e., a lymphangioma containing chyle.

The symptoms are vague at first: loss of appetite, alternate diarrhoea and constipation. Then, more or less suddenly, acute intestinal obstruction develops, with violent pain, great distention, and vomiting. In some cases there is a volvulus, but only if the cyst is mesenteric, not retroperitoneal. On examination, before the onset of obstruction, the cyst may be palpable and very mobile, though the retroperitoneal cysts are fixed. The outline is oval and smooth, and differs from the bossed surface of a cancer. There may be resonance in front of it. The patient may complain that the swelling can be felt rolling about when the trunk is flexed or extended. During the acute stage there is reflex contracture of the abdominal wall, though peritonitis is absent. The cyst may rupture and fill the belly with fluid, or it may suppurate. The treatment is removal, and they generally do well. It may be necessary to resect a loop of gangrenous gut.

REFERENCE.—¹*Lyon chir.* 1926, xxxiii, 566.

MUMPS.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—In view of the rarity of *suppurative parotitis* in mumps it is noteworthy that both the papers by S. Meyer and H. Reifenberg¹ and by O. Wiese² mention a case occurring during an epidemic. The case reported by Meyer and Reifenberg occurred in an infant, age 2 months, who apart from otitis media on the same side as the suppurative otitis showed no signs of a general infection. The diagnosis of mumps in this case was confirmed by the fact that two other infants in the same house had typical mumps. No details are given about Wiese's case.

Encephalitis in mumps, of which H. Bedingfield³ records an example, is rare. Acker in 1913 collected 30 fatal cases, and reported 2 of his own in which he found meningo-encephalitis at the base of the brain post mortem. Bedingfield's case was unusual in that encephalitis preceded the parotid swelling, whereas with the exception of a case recorded by Colomb and Mercier the cerebral symptoms appeared after the parotitis. Complete recovery took place without any sequelæ. A. Wallgren⁴ states that, unlike most of the other forms of meningitis, *mumps meningitis* is usually lacking in striking symptoms and subsides rapidly and spontaneously. It is therefore easily overlooked, and the oversight is not revealed by an autopsy. In Sweden it is not uncommon in spite of the scanty notice given it in the literature. Wallgren reports 6 cases from his own practice. One of these was in a man, age 27, in whom the disease commenced with meningitis and the parotid swelling did not appear until the third day of disease. Another patient, a boy, age 14, whose brother had parotitis complicated by meningitis, showed symptoms of meningitis only, without any inflammation of the parotid or other salivary glands. The meningeal symptoms in this case were slight, but the cerebrospinal fluid showed a well-marked mononucleosis. Similar cases of meningitis as the only symptom of mumps have been recorded by Morquio and Schoerder. Cases of primary mumps meningitis have also been reported recently by E. Joltrain, P. Hillemand, and L. Justin-Besançon⁵ in a girl, age 17, and a boy, age 6, who developed symptoms of meningitis with cerebrospinal lymphocytosis two days before the onset of the parotid swelling. The occurrence of such cases should make one wait for the appearance of parotitis before deciding that a lymphocytic meningitis is tuberculous or syphilitic.

REFERENCES.—¹*Zeits. f. Kinderheilk.* 1926, xli, 163; ²*Arch. f. Kinderheilk.* 1927, lxxx, 253; ³*Lancet*, 1927, i, 543; ⁴*Acta Pædiatrica*, 1926, vi, 53; ⁵*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1927, 1002.

MUSCULAR CRAMP. (*See CRAMP, MUSCULAR.*)**MUSCULAR PARALYSIS, PSEUDOHYPERTROPHIC.** (*See MYOPATHY, PSEUDOHYPERTROPHIC.*)**MUTATION OF GERMS AS A SERIOUS DIFFICULTY FOR PUBLIC HEALTH ADMINISTRATORS.***Joseph Priestley, B.A., M.D., D.P.H.*

The question of mutation of germs has been raised again in connection with some important experiments recently carried out with the germ of relapsing fever, which is a spirochæte. The fever has a tendency to relapse, and, when such a relapse took place, the nature of the spirochæte was found (in the above-mentioned experiments) to have changed in fundamental respects (but not in microscopical appearance) from that of the spirochæte originally causing the first original attack of relapsing fever. How this change or mutation takes place is not known, but the interest in the fact itself is that it is presumable that relapses in other infectious diseases are due, in the same way, to alterations or mutations of the causative germs. This theory strikes at the root of present-day ideas of bacteriological 'carrier' cases (infectious diseases), and, if it proves to be true in practice, the important subject of environment will have to be considered administratively. Can a *non-virulent* germ be made virulent by changing its environment? If so, what is the nature of such change? The 3 to 4 per cent of *non-virulent* diphtheria germs in school children's noses or throats (or both) becomes a very serious problem for School Medical Officers and others concerned in the inspection and treatment of school children.

MYALGIA, MYOSITIS. (*See LUMBAGO.*)**MYOPATHY, PSEUDOHYPERTROPHIC.***Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.*

The phenomena of this variety of muscular dystrophy are almost too familiar to require recapitulation. They are those of pseudo-hypertrophy together with marked weakness of the affected muscles, the enlargement beginning most commonly in the calves. Other muscles waste from the outset without any initial stage of pseudo-hypertrophy, especially the latissimi, pectorals, etc. The muscles of the face, forearms, and hands usually remain normal. The patient has an exaggerated lumbar lordosis when standing, so as to compensate for weakness of the hip extensors. The gait is waddling, and there is special difficulty in going up and down stairs. There is a classic method of rising from the supine position on the floor, so that the patient climbs up his legs, as shown in the annexed pictures, from a case of Lewin's (*Fig. 68*).

The etiology of the malady is still obscure. It is a muscular dystrophy which tends to affect males five or six times as frequently as females. Although females tend to escape themselves, yet they hand on the disease to their male progeny. Timme believes that the malady is associated with pineal deficiency, and claims that four out of five patients in one family observed by him showed a pineal shadow on X-ray examination, indicating premature calcification of the gland. Normally such calcification only occurs in 2 per cent of individuals under 25 years of age, whereas in persons over 50 practically all show a pineal shadow. Timme states that nearly every individual under 20 who shows a pineal shadow is affected by myopathy. This broad statement requires verification by other observers before it can be confidently accepted. P. Lewin¹ was unable to see pineal shadows in any of his 39 cases, nor could he detect them in the published reproductions of Timme's cases. Janney, Goodhart, and Isaacson, however, found pineal shadows in 2 out of 9 cases.

The disease is sometimes associated with hypoglycæmia. This would indicate that other endocrine organs apart from the pineal may be at fault, e.g., thyroid, pituitary, and suprarenal. Acting on the endocrine hypothesis, Timme has treated his cases by **Pineal Substance**, $\frac{1}{16}$ gr. (6 mgrm.) three times a day for three weeks out of five, then **Thyroid** and **Pituitary**, and, as the patient grows older, **Orchitic Extract**. He claims cure in two cases and definite

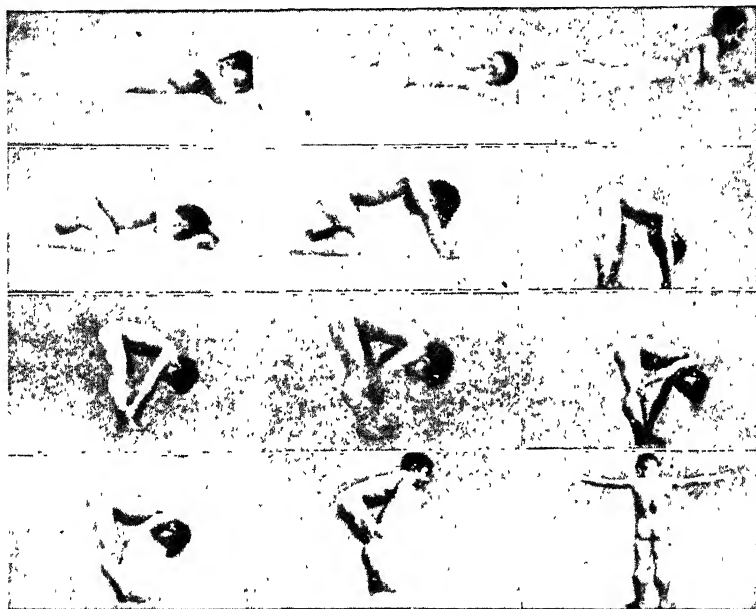


Fig. 68.—Photographs of a patient 'climbing up his legs' in pseudohypertrophic myopathy. (Reduced from the *Journal of the American Medical Association*.)

improvement in four. Lewin, on the other hand, in view of the hypoglycæmia, gives **Suprarenal Extract**, $\frac{3}{100}$ gr. by the mouth, three times a day, in the hope of inducing hyperglycæmia and increasing the metabolism of glucose. These measures, of course, are in addition to the usual directions for the avoidance of muscular fatigue, the prevention of contractures, and general dietetic and tonic measures.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1926, Aug. 7, 399.

MYXÆDEMA.

Ivor J. Davies, M.D.

C. I. Krantz and J. H. Means¹ report six cases of myxædema in which *pigmentation* was noted. It was more pronounced and more often noted on the exposed surfaces of the body. The face, especially the forehead and cheeks, were involved in five out of six cases, and in three the extensor surfaces of the forearms were pigmented. Pigmentation of the mouth and tongue was not present. The pigmentation appeared coincidentally with or shortly after the onset of symptoms of myxædema, but cleared up promptly under thyroid administration. No conclusions regarding its origin were drawn. They state

that thyroid insufficiency may conceivably cause a disturbance in the action of the adrenals, but in the present status of our endocrine knowledge no dependence or relation has been proved to exist between the adrenals and thyroid in this regard.

J. H. Means, P. D. White, and C. I. Krantz,² from the thyroid clinic of the Massachusetts General Hospital, make some observations on *the heart in myxœdema* with special reference to dilatation and angina pectoris. They present a résumé of the literature and two case reports. The following conclusion was drawn: They point out that a lowered tonus of the cardiac muscle in myxœdema may, in occasional instances, give rise to definite dilatation of the heart, which dilatation completely disappears under thyroid treatment. They believe that the discovery of such dilatation, or of evidence of any other sort of cardiac disturbance like angina pectoris, is a direct indication for very gradual thyroidization. With patients who under thyroid medication develop toxic symptoms, whether angina pectoris, or other, one must be content with maintenance at a metabolic level below that at which the toxic symptoms occur.

REFERENCES.—¹*Boston Med. and Surg. Jour.* 1926, Sept., 518; ²*Ibid.* 455.

NAPKIN ERUPTION. (See DERMATITIS OF DIAPER REGION.)

NASAL ACCESSORY SINUSES, DISEASES OF. (See also NOSE, FOREIGN BODIES IN.)

A. J. M. Wright, M.B., F.R.C.S.

Skiagraphy of the Nasal Sinuses.—Dobranski and Lenarowski¹ give as the possible causes of opacity in the X-ray plate of the maxillary sinuses, either under-development, pus, thickened mucous membrane, a tumour, or pathological changes in the neighbourhood. After trying other opaque substances, they have obtained good results by the injection of lipiodol into the maxillary antrum before taking the skiagram. From 4 to 6 c.c. of the fluid are injected through a cannula into the sinuses while the patient is lying on the affected side. The nasal cavity is then plugged with paraffined wool to retain the oil in the cavity, and the skiagram is taken. In cases of suppurative sinusitis with polypi and thickening of the mucous membrane, the shadow is smaller than the normal, and irregular in outline. Where a tumour fills the sinus, small isolated islands of opacity can be seen. Dental cysts can be injected from a fistula in the alveolus, and their relationship to the maxillary antrum be clearly seen.

B. McKelvie² also reports favourably on the method. He injects the lipiodol with a Watson-Williams syringe, and gives an example showing the appearance of small scattered opacities in a case of new growth of the antrum. Paul MacCready advises its use not only for the maxillary antrum but also for the frontal and sphenoidal sinuses.

Catarrhal Sinusitis.—Suppuration in the nasal sinuses is a well-defined condition. That milder degrees of inflammation occur, not characterized by a purulent discharge, is undoubted. Since, however, the exploratory wash-out of a sinus, if not productive of pus, is usually taken as evidence that the sinus is not diseased, not much advance has been made in the differentiation of non-suppurative sinusitis. Oskar Hirsch³ deals particularly with what he describes as a catarrhal inflammation of the maxillary antrum. He points out that while a non-suppurative inflammation of the ethmoidal sinuses, characterized by the formation of polypi, has been recognized for many years, not infrequently, in cases of nasal polypi, the whole lining of the antrum will also be found to be filled by a polypoid degeneration of the lining (*Plate XXII*). While this condition of multiple polypi in the antrum is the one most commonly met with,

PLATE XXIV

CATARRHAL INFLAMMATION OF THE ANTRUM (OSKAR HINCH)

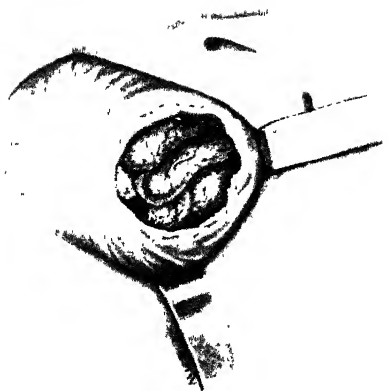


Fig. 1.—Chronic catarrhal antral inflammation: the sinus is filled by edematous folds.

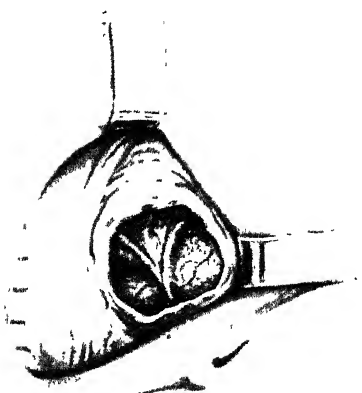


Fig. 2.—Chronic catarrhal antral inflammation: the mucous membrane forms a foot-like elevation filled by an edematous fluid, protruding into a corn.

Re-drawn by permission from the 'Journal of Laryngology and Otolaryngology'.

a single localized cedematous elevation may be present, ending in a cord-like process which passes through the ostium of the maxillary antrum and ends in an cedematous mass, a choanal polyp. While it is no new thing to recognize that nasal polypi may take their origin in sinuses other than the ethmoidal, the opinion of Hirsch, that they most commonly arise in the maxillary antrum, will probably not be generally accepted. In the case of choanal polypi it has long been recognized that the antrum is almost invariably their site of origin. Hirsch's article will, however, prove useful in concentrating attention on the maxillary antrum in cases of polypi, particularly those in which recurrences still take place after the ethmoidal region has been thoroughly dealt with. Hirsch considers that some degree of opacity to X rays in the involved sinus, accompanied by an absence of pus on washing out, is strongly suggestive of this condition. He also draws attention to an observation which must have occurred to others, that in these cases of polypoid or catarrhal inflammation of the maxillary antrum the bony wall is found to be unusually thin.

Cavernous Sinus Thrombosis Complicating Sinusitis.—Wells Eagleton¹ has paid considerable attention to this and allied infections of the venous system associated with suppuration in the nasal sinuses. He publishes here the result of an exhaustive study of 25 cases occurring in his practice, of which 21 proved fatal and 4 recovered. He regards a spread of infection by the veins as being the most frequent path in cases of intracranial infection. If this view is correct, the study of thrombophlebitis in the skull has an important bearing on the occurrence of cases of meningitis and brain abscess. He emphasizes the necessity for early diagnosis in cavernous sinus thrombosis if any improvement in results is to take place. He concludes that the classical cases of cavernous sinus thrombosis accompanied by signs of the blocking of the sinus, namely proptosis, chemosis, etc., are not the only variety which occurs, but that a more chronic slowly obliterating thrombosis may take place without any of these signs. (*See also CAVERNOUS SINUS THROMBOSIS*, p. 74.)

Spreading Osteomyelitis of the Skull.—This distressing disease, although uncommon, is seen from time to time by every rhinologist. Dan McKenzie⁵ gives his experience as a result of the treatment of five cases during the last thirteen years. This spreading infection of the bones of the skull may originate spontaneously, but more usually follows operation. Far and away the most common source of infection is the nasal sinuses, few cases only being recorded of dental or otitic origin. When an operation is the exciting cause, the extent thereof does not seem to be in any way a deciding factor. In the more acute cases signs are noticed within a few days, but in the more chronic an interval of a week or two may elapse between the operation and the onset of the osteomyelitis. The condition may start in the bones of the face or in the frontal bones, and in the former case tends to spread upwards, sparing as a rule, the roof of the orbit. Diagnosis is easy, the occurrence of a slowly spreading swelling of the face or forehead, with the formation of subcutaneous abscesses, being typical. Untreated, the condition will extend, death taking place from septicæmia or meningitis. Treatment should aim at providing a barrier locally to the spread of infection, and employing constitutional methods to combat the infection. To achieve the former purpose an area of healthy bone should be removed around the infection, in addition to the opening of abscesses and removal of dead bone. Operation should be carried out as early as possible, and in planning the method the removal of healthy bone should precede that of the diseased, so as to avoid reinfection as far as possible. As an addition to operation, McKenzie has found intravenous injections of Colloidal Silver apparently of great help. This drug should be administered

daily and pushed to the limit of tolerance. The preparation he has used is **Electrargol**, the dosage being from 2 to 10 c.c. One favourable point in this complaint is that, after recovery, new bone is formed to replace that removed by the surgeon or by necrosis.

REFERENCES.—¹*Ann. de Mal. de L'Oreille, du Larynx*, 1925, Oct.; ²*Brit. Med. Jour.* 1926, II, 58; ³*Jour. Laryngol. and Otol.* 1927, Jan., 39; ⁴*A Clinical Study of Blood-stream Infections*, New York, The Macmillan Co., 1926; ⁵*Jour. Laryngol. and Otol.* 1927, May, 293.

NEPHRITIS.

Hugh MacLean, M.D., D.Sc., F.R.C.P.

Cardiovascular Changes associated with Renal Disease.—E. G. Bannick¹ gives details of some cases of chronic nephritis with death from uræmia in which there was no evidence of any cardiovascular involvement. In one such case the blood-urea ten days before death was 459 mgrm. per 100 c.c., while the creatinin was 19.6 mgrm. The hæmoglobin content was 30 per cent, the red blood-cells 1,490,000, and the carbon-dioxide combining power of the plasma only 20 per cent. Despite these findings there were no retinal changes, nor any evidence of cardiac hypertrophy; the systolic blood-pressure was 130 and the diastolic 65. Bannick concludes his paper with the observation that rare cases of chronic glomerular nephritis terminating in uræmia may occur without hypertension, cardiac hypertrophy, or retinal changes, and that application of this possibility adds important data to the study of hypertension and nephritis. H. MacLean² points out that though hypertension is a common symptom in chronic renal disease it is by no means always present. From time to time cases of chronic nephritis are encountered in which no obvious cardiovascular changes are present. He cites the case of a patient who died in uræmia with a blood-urea content of 320 mgrm. per 100 c.c. and yet no evidence of increased blood-pressure or enlarged heart at any time, though he had been examined at intervals for two years before death. In the course of an investigation into the after-results of nephritis contracted during the Great War, MacLean found that some of these patients recovered from the kidney lesion, but that they gradually developed severe cardiovascular involvement. Other patients, however, showed a progressive deterioration in kidney efficiency with a normal heart and blood-pressure. Thus it would seem that acute nephritis which does not clear up may result either in progressive degeneration of the kidney substance with or without cardiovascular disease, or in cardiovascular disease alone without any evidence of progressive renal disease. Indeed, in many of these patients the kidneys, as judged by renal tests, seemed to be acting quite efficiently.

Nephrosis.—The term 'nephrosis' was introduced in 1905 by Müller to denote a special *degenerative* type of renal disease with the same symptoms as parenchymatous nephritis. The term, however, appears to be an unfortunate one, and its general use has only tended further to confuse the classification of renal disease. It is indeed doubtful whether the alleged condition is a clinical entity, but at any rate it is impossible to say in the case of the average patient during life whether the renal lesion in a case of parenchymatous nephritis is or is not of a degenerative nature. If the condition is inflammatory in nature, the probability is that it will pass into chronic renal disease; if degenerative (nephrosis), it will probably clear up. In the opinion of the writer the term 'nephrosis' serves no useful purpose. For several opinions on the subject see Elwyn,³ Murphy and Warfield,⁴ Epstein,⁵ Davidson,⁶ Bennett.⁷

TREATMENT.—There is very little new in regard to treatment. A. A. Osman⁸ recommends the use of **Alkali Salts** given by the mouth in the treatment of nephritis. These alkalis are given in the form of potassium citrate, potassium bicarbonate, sodium bicarbonate, and sodium citrate, generally in equal parts

of water. When sodium bicarbonate alone was used, it was found in every case that a stage of initial oedema or increase in existing oedema was encountered. This initial increase was much less marked if potassium salts were added to the mixture. Potassium salts alone, however, may produce severe diarrhoea and possibly have a toxic action on the heart. The alkali is given in necessary doses until the urine becomes alkaline to litmus, though this amount is generally below that required to produce a diuresis. The lowest dose used was 240 gr. in twenty-four hours, whilst in one case 2100 gr. proved to be ineffective. The dosage should be distributed evenly throughout the twenty-four hours and increased daily to the optimum. Certain dangers of this treatment are discussed.

M. Smith⁹ states that diets of lower protein content than now in common use in the **Dietary Treatment** of chronic nephritis with nitrogen retention are feasible. The amount of protein allowed in the diet should be based upon the amount of non-protein nitrogen which the patient is able to excrete during twenty-four hours. If it is desired that the nitrogen retention be relieved, the nitrogen from the protein in the diet should be less than the total twenty-four-hour non-protein nitrogen in the urine. When the twenty-four-hour nitrogen excretory capacity of the kidneys equals the amount of endogenous nitrogen katabolism, it will be impossible to relieve nitrogen retention by dietary measures. With properly constructed diets it is approximately accurate to calculate the endogenous nitrogen katabolism at 0.02 to 0.03 grm. per kilo. of body weight per twenty-four hours. When any subject partakes of a diet which satisfies the energy requirements in full, but with protein nitrogen content of less than 1 grm., there is at first a strong negative nitrogen balance and then this gradually diminishes until it approaches a minimum. If such a diet is indefinitely prolonged, it might be possible to deplete the body protein to a dangerous extent. However, there is sufficient evidence to show that such a point would not be reached for many months. This fact makes it practical to administer diets of very low protein content to patients having chronic nephritis with nitrogen retention; for, where chronic nephritis has progressed to such an extent as to make necessary diets practically free from protein, other complications of the disease will be more apt to prove fatal sooner than the effects of protein starvation can become apparent. These measures are highly practical in rapidly relieving nitrogen retention, which is the result of excessive protein intake in the presence of a moderate degree of renal insufficiency; after relief of retention a protein intake could be given which would ensure nitrogen balance.

REFERENCES.—¹*Arch. of Internal Med.* 1927, May, 741; ²*Lancet*, 1927, i, 1256; ³*Arch. of Internal Med.* 1926, Sept., 346; ⁴*Ibid.* Oct., 449; ⁵*Jour. Amer. Med. Assoc.* 1926, Sept., 913; ⁶*Canad. Med. Assoc. Jour.* 1926, Sept., 1039; ⁷*Lancet*, 1927, i, 3; ⁸*Guy's Hosp. Rep.* 1926, Oct., 412; ⁹*Boston Med. and Surg. Jour.* 1927, April 21, 649.

NERVE-ROOT SECTION FOR PAIN. (See RHIZOTOMY.)

NERVES, PERIPHERAL, SURGERY OF. *Geoffrey Jefferson, M.S., F.R.C.S.*

Suture of Digital Nerves.—Sherren's classical monograph on nerve injuries taught that these should be sought as a routine in lacerated wounds about the wrist-joint; and it is certain that far fewer nerve divisions in this region escape recognition and appropriate treatment to-day than was the case twenty-five years ago. With the smaller branches in the hand, and particularly in the fingers, the case is otherwise. Yet the need for treatment is no less pressing, for impaired digital sensation is a very serious disability to the working man, and indeed to anybody who wishes to use his hands intelligently. Even when the repair of a cut tendon has been satisfactorily made and mobility restored,

the diminution in the power to feel textures, to measure distance and movement, is always tiresome and often worse.

Sterling Bunnell,¹ as the result of his experiences in 105 sutures of the nerves of the hand, is a most enthusiastic believer in routine operation. Of all nerve sutures throughout the body, he says, those that are most uniformly, promptly, and completely successful are those of the hand and fingers. He sutured 45 digital nerves, and 60 in the palm. Three times he sutured the branch of the median running to the muscles of the thenar eminence. This he regards as the most difficult on account of the small size of the nerve. He has also sutured the deep branch of the ulnar, with the usual good result. The suture material which he employs is the finest silk, which may be unravelled, if need be, and the most tenuous strands used. His results are the more striking because in several cases severe infection had followed the original injury, and tendon-reconstruction procedures had to be done as well. These he prefers to leave till nerve regeneration has taken place in order to obviate the possibility of trophic troubles with the graft—a remote chance perhaps, but the man is immediately in a better position to make use of his hand if sensation has returned, and he is more encouraged. Bunnell has not hesitated to make use of free grafts from the superficial nerves of the calf when a gap had to be bridged, and contrary to the current expectation these have done well.

Fibroma.—Margottini² describes two cases of fibroma of the great nerves of the forearm. The first occurred in a woman, age 37, who had a tender swelling the size of a nut on the inner side of the forearm in the region of the ulnar nerve in its upper third. It was removed entirely at operation, and following this there was a complete lesion of the ulnar nerve. The second case was in a 16-year-old patient who for two and a half years had a rounded swelling beneath the palmar fascia of the right hand. This was believed to be a lipoma, but at operation it was found to arise from the trunk of the median nerve. A considerable length of nerve was found to be involved. Histologically it was proved to be a diffuse fibroma. [Localized tumours are by no means common, and the diagnosis will not often be difficult. It is, as a rule, not necessary to make a block excision of the nerve, as the tumour can with care be shelled out without gross damage to the nervous elements. That is to say, the tumour has no essentially nervous elements in it, but arises from the internal connective-tissue architecture of the nerve-trunk.—G. J.].

Recurrent Laryngeal Paralysis.—Paralysis of the recurrent laryngeal nerve is one of the bugbears of goitre surgery. It may happen to the most experienced surgeons, but modern technique which we owe to the intensive study of goitre in the hands of a few individuals has led to distinct improvements in this respect. Paralysis of one cord alone is little more than a temporary nuisance to the patient, unless he or she is in the habit of making unusual demands on the vocal apparatus. After a period of flaccid paralysis the cord retracts laterally and the glottis is widened again, and little or no difference in the voice may be detected. Bilateral paralysis is a much more serious condition and may lead to severe dyspnoea from the approximation of the flaccid cords. Trotter devised an ingenious plastic operation on the cords, but we owe to Sir Charles Ballance³ and C. H. Frazier⁴ the modern operation of nerve suture.

The descendens noni, which is a very much larger nerve in the living than appears in the formalin-hardened body, is anastomosed to the recurrent laryngeal nerve. Frazier has reported the results of operation in 12 cases, in 2 of which a bilateral operation was performed. All of these paralysees followed operations for thyroidectomy. In 2 cases the operation was a failure from the fact that the peripheral ends of the severed nerves were not discoverable, and

it was thought that in these the entire peripheral portion must have been avulsed. The remaining 10 operations were technically successful: 5 were judged improved, 1 has recovered, and 4 were failures, but the palsy had existed in one case for eleven years and in another for nine years; and in only one case had it been present for less than a year. He thinks six or seven years the maximum duration after which improvement is to be expected, but we should imagine that this is too long, judged from experience with nerves elsewhere. The advantages of the descendens hypoglossi (noni) are that the nerve lies easily accessible in the region in which it is required, that it is very long and can be transplanted without tension; further, it supplies the accessory muscles of the larynx and should therefore be physiologically a sound nerve to employ. At operation, the first step consists in isolating and identifying the stump of the recurrent laryngeal nerve, the most difficult phase of the operation, as it may be buried in scar tissue. C. H. Frazier recommends that dissection should begin at the point where the nerve enters the larynx at the inferior cornu of the thyroid cartilage. The nerve is traced down until its point of severance is found, and it is then sutured to the descendens noni. Ballance has used the phrenic in his experimental work on monkeys and got excellent results. Frazier reports that he has succeeded in using this in one human case, but it was too early to be sure of the result. A previous attempt on another patient had had to be abandoned owing to respiratory difficulties. Sir Charles Ballance⁵ performed a phrenico-recurrent anastomosis on both sides at a month's interval on a case of Mr. Barnes', in June, 1926.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1927, Feb., 145; ²*Policlinico* (Sez. Chir.), 1926, Aug., 395; ³*Brit. Med. Jour.* 1924, II, 349; ⁴*Surg. Gynecol. and Obst.* 1926, Aug., 134; ⁵*Proc. Roy. Soc. Med.* 1926, Nov.

NEURALGIA, TRIGEMINAL.

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

The first essential in the rational treatment of neuralgia is an accurate diagnosis of its cause. Local causes capable of exciting reflex pain must first be excluded: so also must tumours, inflammatory lesions, and various other causes of toxic or infective character, e.g., gout, diabetes, malaria, alcohol, lead poisoning, malaria, syphilis, and so on. Then, and only then, are we justified in diagnosing primary or essential neuralgia. Cases of trigeminal neuralgia have been classified by Wolf¹ under five groups: (1) The common, minor, or ordinary facial neuralgia; (2) The typical paroxysmal tic douloureux or major neuralgia; (3) A variety intermediate between the first two—chronic inveterate neuralgia; (4) Artificial neuralgia, resulting from alcohol injections administered for the relief of neuralgia; (5) An atypical ophthalmic type of neuralgia, occurring chiefly in women.

TREATMENT.—In regard to this, two great classes are at once distinguished—those in which the cause can be discovered and removed, and those of so-called essential neuralgia in which we are forced to treat the symptom itself. Here we have three varieties of treatment from which to choose: (1) Analgesic remedies, applied either locally or internally. (2) Physical remedies, e.g., radiotherapy, diathermy, galvanism, ionization, etc. (3) Surgical intervention: this includes the well-known alcohol injections into the foramina of exit of the affected division; it also includes various operations on the trigeminal, whether in front of the Gasserian ganglion, at the ganglion itself, or at the retroganglionic sensory root. There is also another mode of attack directed at the peri-arterial sympathetic plexus which innervates the facial vessels.

Analgesic Drugs of all sorts, often combined with local hot applications, are invariably tried in the first instance in every case of severe neuralgia. When

these fail, we are left with the alternatives of some kind of physiotherapy, or we may be driven to surgical intervention.

Physical Remedies.—Of these, **Galvanism** until recent years had the widest vogue. To be effective it has to be applied in strong currents of 80 or even 100 ma., in séances lasting 45 minutes or longer, at frequent intervals over a period of several months. The efficacy of the galvanic current is enhanced by using it for **ionization**, or the driving in of ions of such drugs as salicylates, quinine, or aconitine. **X-ray Treatment** is another physical method which has been warmly supported, although it is confessedly more useful in acute than in chronic cases. During the last four years A. Müller,² of Rostock, has treated 23 cases of trigeminal neuralgia by X rays. In the old days there was a risk of producing X-ray burns of the skin; this is now avoided by careful dosage and improved technique. Another objection—the risk of producing adhesions around the Gasserian ganglion and thereby rendering subsequent surgical operations excessively difficult—is pronounced by Müller to be without foundation. On the contrary, he maintains the converse proposition, viz., that previous alcohol injections diminish the likelihood of X rays proving beneficial, and stoutly suggests that the treatment which is least dangerous should be tried first and that surgical intervention should only be considered after X rays have had a fair trial with negative results. The precise mode of action of X rays on the Gasserian ganglion is disputed; some authorities ascribe the effect to an artificial capillary hyperæmia of the ganglion, thereby carrying off inflammatory products, others to a specific sedative action on the nerve-tissues. Be this as it may, it is noteworthy that, in practically every case treated, there is an immediate reaction consisting of an exacerbation of pain in the affected area and suggestive of a hyperæmic effect on the ganglion. This is so regularly to be expected that the patient should always be warned of it beforehand, lest he be discouraged from persevering with the treatment. The more recent the case of neuralgia, the more violent is this temporary reaction, which subsides in a few hours, or at the most in a day or two. Out of Müller's 23 cases, 5 (all of which had previously been injected by alcohol) were unbenefited by X rays, 4 were improved but relapsed later, 5 recent cases were at once cured, whilst of the remaining 9 (all old-standing cases), 7 were freed from pain after two or at the most three treatments, whilst 2, after temporary improvement, relapsed. Müller gives a careful description of his technique, in which it is essential to have an installation that permits of deep irradiation, exact dosage, and efficient protection of the skin by suitable filtration. He irradiates the ganglion at a depth of 5 cm. from the surface in the temporal fossa through an aperture measuring 4 by 3 cm.

Diathermy is claimed to be highly efficacious at the hands of Bordier, of Lyons, whose work on diathermy in acute poliomyelitis is already well known (*see* MEDICAL ANNUAL, 1926, p. 369). Here, again, a correct technique is all-important for the securing of good results. He uses a wet sponge electrode over the painful area and applies a current as intense (800 to 1000 ma.) as the patient can bear, using an interrupter from time to time. The other electrode, a large metal plate, is placed in the mid-dorsal region. The whole séance lasts 20 or 30 minutes, and is repeated daily. For the first half of the séance the wet electrode is applied, causing the skin to become red and warm; this is then replaced by a metal electrode of tin or lead, fixed securely on the affected area of skin for 15 or 20 minutes.

Surgical Methods.—**Alcohol Injections** still play an important part in the relief of trigeminal neuralgia, especially in cases limited to a single division of the nerve. By injecting the appropriate foramen of exit, relief of pain can usually be obtained for a period of many months. When the nerve

regenerates, however, the pain may recur, and must again be allayed by a second or even a third injection. The advantage of alcohol injections, in skilled hands, is the absence of shock and the obviating of any mutilating scar of the face. Cases where alcohol injections fail or lose their effect have still in reserve various major operations. In the old days resection of the Gasserian ganglion was commonly recommended. This was a formidable undertaking with a mortality estimated at from 12 to 22 per cent. This operation accordingly has been superseded by **Retroganglionic Section of the Sensory Root**, originally introduced by Spiller, of Philadelphia, in 1901. Since then, in a series of 432 consecutive operations by C. H. Frazier,³ the mortality has been only a fraction of 1 per cent. Since 1915 Frazier has replaced total section of the sensory root by *subtotal division*, in which the outer two-thirds of the root are alone sectioned, leaving undivided the inner third and thereby sparing the patient the risk of trophic changes in the eye. Since 1919 Frazier has further shown that it is possible to avoid sectioning the motor root, which accompanies the third division of the nerve through the foramen ovale. If the motor root be spared, the patient does not have subsequent paralysis of the masticatory muscles on the affected side. This is of importance in the infrequent cases where a bilateral trigeminal neuralgia calls for operation. Hitherto, when a patient has been cured of trigeminal neuralgia on one side by division of the sensory together with the motor root, and subsequently develops similar neuralgia on the opposite side, the surgeon is naturally inclined to suggest alcohol injections on the second side, for fear of inducing bilateral masticatory paralysis. Frazier had one such case and succeeded in dividing the sensory root alone on the second side, leaving the motor root intact. Temporary paralysis of the masticatory muscles supervened for a week, but ultimately recovered, and the patient remained able to use the muscles on that side; those on the first-affected side were already permanently paralysed as a result of the first operation.

An entirely different surgical procedure is that which is directed to the *sympathetic fibres* of the vessels in the neuralgic area. The symptoms of tic douloureux, although distributed in the territory of the trigeminal nerve, are essentially of angioneurotic type, analogous to the pains of intermittent claudication of the limbs. The paroxysms of pain are accompanied by vegetative phenomena, such as flushing of the face, dilatation of the pupil, excessive lachrymation, and sometimes secretion of nasal mucus and saliva, all on the affected side. Not only do the paroxysms occur spontaneously, but the slightest stimuli, especially those which induce vasomotor and other sympathetic reflexes, suffice to induce an attack. It has accordingly been suggested that the real cause of the painful paroxysm may be vasomotor spasm in the arteries of the Gasserian ganglion. Acting on this hypothesis, Trousseau in 1892 suggested **Ligature of the External Carotid Artery** on the affected side, thus destroying the vasoconstrictors in its adventitial coat. Since 1900 Cavazzini had successful results following **Excision of the Superior Cervical Ganglion** of the sympathetic chain; and more recently Sokolow, in Wischnewsky's clinic at Kasan, performed **Peri-arterial Sympathectomy** of the external carotid in 5 cases, with good results in 4. Later still Nasaroff,⁴ of Saratow, has treated 3 cases by simply exposing the external carotid for an extent of 4 or 5 cm., and swabbing it with 80 per cent Alcohol so as to produce degeneration of the peri-arterial plexus. The immediate results as to relief of pain were satisfactory. None of his cases, however, has been followed up for more than a couple of months, so that it is too early to decide as to the permanency of these results.

REFERENCES.—¹*Amer. Jour. Physiotherapy*, 1926, April, 17; ²*Munch. med. Woch.*, 1926, Nov. 12, 1915; ³*Jour. Amer. Med. Assoc.*, 1926, Nov. 20, 1730; ⁴*Zentralbl. f. Chir.*, 1927, April 16, 964.

NEUROSYPHILIS. (*See SYPHILIS OF THE CENTRAL NERVOUS SYSTEM.*)**NOSE, DISEASES OF.** (*See NASAL ACCESSORY SINUSES, DISEASES OF; NOSE, FOREIGN BODIES IN; RHINITIS, ATROPHIC; RHINORRHOEA.*)**NOSE, FOREIGN BODIES IN.***A. J. M. Wright, M.B., F.R.C.S.*

Foreign bodies in the nose are not very rare, and owing to the suppuration and other secondary changes produced, the diagnosis may not be easy. A foreign body is usually introduced in childhood, but sometimes, as in the case of projectiles, it may reach the nasal cavities by penetration of its walls. In the former case it is found most commonly in the right side of the nose and lies between the inferior turbinal and the septum. If not removed it may remain in the nasal passages for a more or less unlimited period. The degree of symptoms produced depends somewhat on its consistency, non-absorbent objects such as glass beads producing the minimum of reaction. In all cases the symptoms produced are unilateral nasal discharge, obstruction, excoriation of the upper lip, and sometimes epistaxis. Pain may be present, being neuralgic in type and felt all over the affected side of the head. Conjunctivitis or a nasal sinus suppuration may be a secondary result. The presence of a unilateral nasal discharge should always raise the suspicion of a foreign body, although other conditions producing this symptom are nasal sinus suppuration, malignant disease, or the ulceration associated with syphilis or tubercle.

Douglas Guthrie,¹ dealing with foreign bodies, particularly in children, subdivides the cases into those in which there is a history of the introduction of the foreign body and those in which there is not. He draws attention to a type of foreign body, a piece of marine sponge, which he has found to be present in a quarter of the cases, and suggests that this may have been introduced by the parent in cleaning out the nostrils. This particular foreign body,



Fig. 69.—Rhinolith formed by deposition round a glass bead. (*Natural size.*)

owing to its absorbent nature, produces a considerable degree of fœtid discharge, and this usually prevents a view being obtained of the foreign body. In each case it was removed blindly with forceps. When a foreign body remains undiscovered in the nose, irritation and inflammation are produced. In course of time a deposition of calcium salts, chiefly the phosphate, tends to take place round

the foreign body, and we then have a *rhinolith*. A rhinolith, or nose stone, as has been said, is usually the result of deposition round a foreign body, but is stated sometimes to occur with a nucleus of dry mucus or blood-clot. As in the case of a simple foreign body, it tends to be situated between the inferior turbinal and the septum, and, with increase in size, produces ulceration, so that eventually it may become firmly impacted in the nasal passages. The specimen illustrated (*Fig. 69*) is an unusually large one and was removed by the reviewer from a woman of 58. The nucleus, in this case, consists of a glass bead which, presumably, was introduced into the nostril in childhood, so that the rhinolith had been forming for possibly 50 years. The symptoms in this case were characteristic, consisting of an offensive unilateral discharge and some pain which raised the question of the possibility of malignant disease.

One of the commoner varieties of foreign body is what may be described

as the surgical one. Among such, a fragment of gauze or wool is most frequently met with, having usually been left in during the performance of an operation. Fragments of instrument, rubber tube, etc., also form examples. Cases have occasionally been recorded in which a metal style, introduced into the lachrymal passages for stenosis, has, at a later interval, been removed from the nasal passages into which it had passed. In any case in which obstruction and discharge are present following an operation on the nose, this possibility should be borne in mind. As far as foreign bodies, such as bullets which have entered through the walls, are concerned, there is nothing particular to be said, the history usually giving the diagnosis. Teeth, either whole or in part, may find their way into the nose, either from an abnormality in eruption or by being forced there during attempts at extraction.

Another group of foreign bodies met with, chiefly in the tropics, is that of insects, etc. Of these, the larva of a fly, the Texas screw-worm, produces an ulcerative condition with necrosis of the bones. Usually the individual suffering from this disease has previously been the subject of a suppurative condition in the nose, and the fly lays its eggs during sleep on the decomposing organic matter in the nasal passages. Cases in which a cockroach has been blown out of the nose, into which it had entered during sleep, have been recorded. Filling the nasal passages with oil to suffocate the insects, or the inhalation of chloroform, will probably prove effective.

DIAGNOSIS.—In the child, the presence of a unilateral discharge is always strongly suggestive of a foreign body. The only other condition likely to give rise to this symptom is a suppuration in the antrum. Inspection of the nose may reveal the foreign body, or, failing this, it may be felt with a probe, but for this an anæsthetic is usually necessary. A skiagram will generally differentiate between a foreign body and an antral sinusitis. In the adult a foreign body has to be diagnosed from a sinus suppuration, tubercle, syphilis, and malignant disease. A skiagram again is of great help, and if the foreign body is opaque it will settle the diagnosis. A long history of the symptoms should throw doubt on the diagnosis of malignant disease, and microscopical examination of the granulations caused by ulceration from a foreign body will show the presence of a large number of giant cells. A rhinolith, when it can be seen, is usually nearly black in colour, rough on the surface, and situated towards the floor of the nose. The only condition likely to simulate it is a sequestrum associated with syphilis.

METHOD OF REMOVAL.—In the majority of cases the foreign body can be seen, felt, and removed under an anæsthetic. In the child an anæsthetic is nearly always necessary. Soft foreign bodies, such as a piece of sponge, are most easily removed with forceps, and a finger in the nasopharynx may be useful in preventing the foreign body from being pushed backwards. Smooth objects, such as beads, are most easily removed by a probe, the terminal quarter of an inch or so of which is bent at a right angle to form a hook. In the case of a rhinolith it may be necessary to break it up to facilitate removal.

Foreign Bodies in the Nasal Sinuses.—For practical purposes these are confined to the maxillary antrum. The commonest variety is probably a tooth, surgical foreign bodies coming next in frequency. As in the nasal passages, so in the antrum, a foreign body which has been present for a considerable period may become the nucleus of a concretion. The reviewer has recorded a case in which a concretion was removed from the antrum, the nucleus of which was found to be the apex of the root of a molar tooth which had been extracted many years before. A foreign body in the antrum may produce no symptoms, but is usually accompanied by suppuration in that

cavity. The pain and offensive nasal discharge induced may give rise to the suspicion of malignant disease, and at least one case is recorded in which the upper jaw was removed on this supposition, only to disclose a calculus. Apart from the signs of suppuration, i.e., a nasal discharge, neuralgic pain in the cheek is frequently the only symptom. Diagnosis depends on seeing the foreign body in the skiagrams, or discovering it on opening the antrum through the canine fossa.

REFERENCE.—*Jour. Laryngol. and Otol.* 1926, July; 454.

ŒSOPHAGUS, DISEASES OF.

A. J. M. Wright, M.B., F.R.C.S.

Carcinoma.—The diagnosis of carcinoma of the œsophagus is seldom established early. Jean Guisez¹ points out that if the case can be recognized while the growth is still confined to the œsophageal wall, there is a possibility of cure by radium. He gives a review of signs and symptoms, by attention to which earlier diagnosis should be possible. In regard to the difficulty in swallowing, this is not by any means constant or progressive in the early stages. The first symptom noticed is an uncomfortable sensation in one particular part during the swallowing of an unusually large bolus of solid food, which may necessitate drinking to wash it down. This initial difficulty may be followed by a long period of freedom, thus tending to a diagnosis of spasm. The difficulty may be as marked for the swallowing of fluids as of solids. Cancer of the œsophagus until its very latest stages is painless and is unaccompanied by cachexia. X-ray examination may be extremely misleading, as the mere fact that the barium meal passes readily is no proof of the absence of an early growth in the œsophageal wall. The lesson therefore is that in all cases, particularly in men of middle age and over, in which symptoms, however slight, suggestive of an œsophageal lesion exist, a careful direct examination with the œsophagoscope should be made.

TREATMENT.—This was dealt with in the section of surgery of the Royal Society of Medicine. F. J. Steward,² in opening, dealt particularly with the possibility of cure by removal in growths at the upper end of the œsophagus. These have been successfully removed through the neck, and this operation would seem to be indicated in suitable cases. In the case of carcinoma involving the middle portion of the œsophagus, the difficulties are very much greater, both as regards deciding the extent of the growth before operation, and also as to the technical difficulties of access and removal. As far as is known, only three cases have so far been successfully operated on. Steward has himself attempted operation in three cases, all of which ended fatally. As a result of his experience, however, he does consider that, with a suitable technique and above all with earlier diagnosis, the operation will probably become established in the future. In those cases in which palliative treatment only is possible, he had found gastrostomy to be preferable to any form of intubation. H. S. Souttar, on the other hand, regarded the prospects of radical removal as very dubious. In his experience, cases were only recognized late in the disease. Tubes of his own design had proved satisfactory in his hands (see *MEDICAL ANNUAL*, 1925, p. 313). To perform intubation, after a preliminary dilatation of the stricture with Jackson's bougies up to 11 mm., he inserts his special tube made of a spiral coil of German-silver wire. With the tube in position, the patient is enabled to take finely divided solid food, and the average duration of life of twenty-six cases which he had followed up was over five months. Walter Howarth stated that after a thorough trial of radium treatment, with the technique advised by Guisez, he was profoundly disappointed. He had found Souttar's tubes of decided utility. In cases in which the Souttar tube became blocked, small drinks of hydrogen peroxide

PLATE XXV

ENDOSCOPIC APPEARANCES IN CANCER OF
THE ŒSOPHAGUS



Fig. A.—Proliferative type.



Fig. B.—Ulcerative type.



Fig. C.—Scirrhus type, with commencing proliferation.

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and water, with abstinence from food for a day, usually resulted in a clearance.

A. L. Abel is among those who consider that radical removal holds out a prospect of success in the future. In a Hunterian Lecture³ he emphasizes, as Guisez has done, not only the necessity, but in many cases the possibility, of early diagnosis. He notes the absence of pain and the presence of a sense of discomfort behind the sternum, occurring intermittently, associated with the taking of solid food, and relieved by draughts of fluid. He points out that examination with the X-ray screen yields more information than with the plate, and that in early cases, although there may be no obstruction, the lodging of a small fragment of opaque substance at the site of the growth may be noticed. In cases in which radium treatment is to be performed, the lower level of the growth can be marked out by taking a skiagram after the patient has swallowed an opaque mixture in the Trendelenburg position. Œsophagoscopy is of vital importance in the diagnosis, and three varieties of growth may be recognized—the proliferative, the ulcerative, and the scirrhus (*Plate XXI*). The mobility or otherwise, as seen through the tube, of the portion of œsophageal wall involved, is of importance as an indication of the extent of the growth. In regard to operative treatment, Abel has not been successful with Soutar's tubes but prefers a gum-elastic one such as Symonds'. He has not had good results from the use of radium, but regards *Diathermy* as of some utility. The main scope of his lecture was to describe the technique of operations for the *Radical Removal* of œsophageal carcinomata. This is done in great detail, and he makes the perhaps somewhat optimistic statement, in conclusion; that with early diagnosis in the future he sees no reason why malignant disease of the gullet should not be treated by removal with as much success as carcinoma in other regions of the body.

Cardiospasm.—The fact that the condition has received such divers names as cardiospasm, achalasia, idiopathic dilatation, phrenospasm, etc., indicates how little is known as to its nature. G. W. Raike,⁴ as a result of the histological examination of the œsophageal wall from three cases, has demonstrated a degeneration of Auerbach's nerve plexus in the œsophageal wall, particularly towards the lower end. It has been previously demonstrated that experimental or pathological section of the vagus may give rise to cardiospasm, and it seems probable, in many cases at any rate, that the degeneration of Auerbach's plexus, in which the vagal fibres end, is responsible for the condition. Gaskell has shown that the maintenance of tone depends on the vagus, and an ascending degeneration of Auerbach's plexus may thus explain the enormous dilatation of the œsophagus which occurs in these cases.

Arthur F. Hurst⁵ gives a summary of his views on the condition and details of treatment with the *Mercury Bougie* which he has introduced. The mouth of the œsophagus is closed during rest by the inferior constrictor of the pharynx and the lower end by the cardiac sphincter. During swallowing, the upper sphincter relaxes, and the food is propelled down the œsophagus by a peristaltic wave of contraction, preceded by a wave of relaxation. According to Hurst, in these cases the peristaltic wave is insufficiently strong to overcome the resistance afforded by the cardiac sphincter. The whole œsophagus therefore fills with a column of food 8 in. high. Any addition to this column at the upper end produces sufficient pressure to force a corresponding amount from the lower end into the stomach, the œsophagus, however, remaining full. A lowered level of nutrition is thus maintained. Owing to the long course of the disease, the œsophageal muscles, by over-action, may become gradually hypertrophied and, owing to the accumulation of food, the œsophagus be abnormally dilated. As has been mentioned above, the lack of tone may also

be a factor in this dilatation. It is thus suggested that the etiology is similar to that of heart-block, in which an inflammation, degeneration, or syphilis involves the nerve plexuses. The onset of symptoms is frequently sudden, the first complaint being a feeling of discomfort behind the lower end of the sternum. This increases and, later, food which is undigested and alkaline may be ejected. Its ejection may be more or less voluntary, and may become a habit after every meal. The individual loses weight at first and tends to eat slowly and restrict himself to fluids or semi-solids. In time, a condition of equilibrium is established. The condition is frequently mistaken for a gastric disorder, but the history and examination of ejected material should exclude this. In carcinoma of the lower end, the onset is more gradual and the course more steadily progressive.

X rays will establish the diagnosis (*Plate XXVI*). The whole of the opaque meal is seen to accumulate in the œsophagus, and, although peristalsis may be observed, no food enters the stomach until the œsophagus is filled. This extreme dilatation of the œsophagus is never seen in cases of cancer.

TREATMENT.—In early cases, attention to the diet, with careful mastication and perhaps the use of *Belladonna* internally, may help. In the majority of cases, the essential in treatment is *Dilatation of the Cardiac Sphincter*. For this purpose; rubber tubes filled with mercury are in every way satisfactory. These, by their own weight and sinuosity, find their way through the cardia, as a rule without any difficulty. The mercury bougie is 31 in. long, and the size employed varies between gauges No. 28 to 34. On the first occasion the bougie is passed during an X-ray examination, and when it has been seen to have entered the stomach by 1 or 2 in., a mark is made on it at the level of the teeth. At this first sitting, increasingly larger bougies are passed. The patient is then instructed to pass the largest one possible before each meal, retaining it at first in position for a quarter of an hour. As improvement takes place, the bougie is passed at first once daily and for only a short interval, and later its use is diminished as far as may be found possible in the individual case. In early cases, permanent cure results, but in many instances it is necessary for the patient to pass the bougie daily. Other methods of dilating the sphincter have been described, e.g., by a hydrostatic bag, by a metal dilator passed through the œsophagoscope, or by several gum-elastic bougies passed side by side (Guisez). The mercury bougie is preferable to all these methods, both in regard to ease of employment, safety, and efficiency. In the rare cases in which the bougie is not effective, various operative measures have been employed through an abdominal incision. These have consisted either in simple dilatation of the cardia with the fingers, or in some form of plastic operation or anastomosis between the dilated œsophagus and the stomach. In any severe case, even after retention has been avoided, it is advisable to avoid articles of diet containing such residue as pips or vegetable skins, etc.

Brown Kelly,⁸ in the Semon Lecture, 1926, dealt with nervous affections of the œsophagus as a whole. In regard to cardiospasm, he considers that there is a considerable element of true spasm in these cases and states that on œsophageal examination, as the tube approaches the lower end of the œsophagus, the cardiac sphincter can be seen to contract owing to the irritation of the tube. He agrees that the condition is probably due to a degeneration of the vagal nerve-endings in Auerbach's plexus. In regard to treatment, he prefers the use of Gottstein's dilating bag, although, as has been said, the mercury bougie would seem to be preferable. The enormous dilatation of the œsophagus which takes place in these cases is well illustrated in *Plate XXVII*.

Spasm at the Upper End.—Brown Kelly gives also a very clear account of this not very uncommon condition. The patients are almost invariably middle-aged

PLATE XXVI

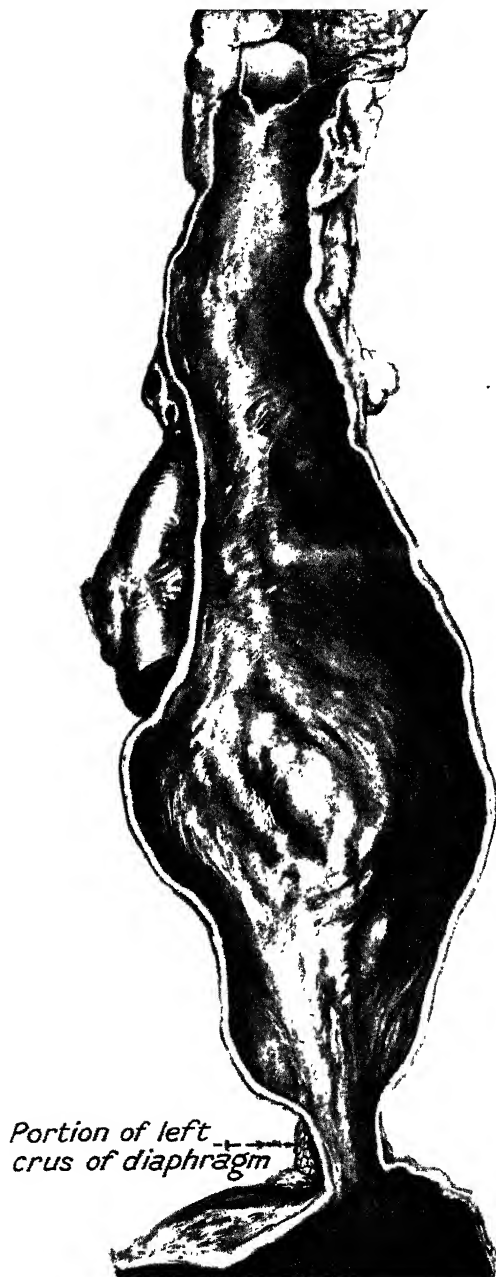
X-RAY DIAGNOSIS IN CARDIOSPASM



Barium in dilated S-shaped oesophagus.

From an article by Mr John Morley, by kind permission of the 'Lancet'

PLATE XXVII—ŒSOPHAGECTASIA



From the Pathological Department, Victoria Infirmary, Glasgow.

Kindly lent by the 'Journal of Laryngology and Otology'

women. The difficulty in swallowing is located at the level of the larynx, and, when the patient is first seen, this has usually been present for many years. The patient has gradually adapted herself to the conditions, so that solids have been very largely given up and the diet consists chiefly of milk, eggs, soup, etc. Choking attacks frequently necessitate the patient leaving the table, and slow prolonged mastication is employed. As a rule these patients avoid eating with others owing to the length of time taken and the possibility of choking attacks. Many of the cases are highly neurotic. On examination, mouth and pharynx may be normal, but in many cases a pale atrophic condition of the tongue and pharynx are present, with a tendency to cracking at the angles of the mouth. Whether these changes are a primary affection, or are secondary to the poor nutrition, is as yet undecided. Not very infrequently carcinoma ultimately supervenes behind the cricoid. Treatment consists in **Over-stretching** the entrance to the œsophagus. This is best accomplished on the first occasion by the use of the œsophagoscope, thus both establishing diagnosis and initiating treatment. As a rule, immediate improvement is noticed, but it may sometimes be necessary to pass a bougie at intervals to maintain it.

REFERENCES.—¹*Presse méd.* 1926, July 31, 964. ²*Lancet*, 1926, ii, 1006; ³*Brit. Jour. Surg.* 1926, xiv, July, 131; ⁴*Guy's Hosp. Rep.* 1927, April, 141; ⁵*Lancet*, 1927, i, 618; ⁶*Jour. Laryngol. and Otol.* 1927, April, 221.

OPTIC NERVE, AFFECTIONS OF. *Lt.-Col. A. E. J. Lister, I.M.S. (retd.).*

Acute Optic Neuritis due to Secondary Syphilis.—Reganati,¹ in describing this case, points out such cases are rare in secondary syphilis as compared with tertiary; they are more amenable to treatment, which must, however, be energetic. This was a very severe case in which there was no perception of light in the right eye, and ability to count fingers only in the left. Lumbar puncture showed high pressure. Two cgrm. of *Mercuric Iodide* were given at once, with visible improvement. Two days later, a first injection of 0.15 grm. of *Neosalvarsan* was given, and the dose worked up to 0.6 grm. Complete cure resulted in a month. It is clear, the author says, that the lumbar puncture was very beneficial. The interesting point is that arsenical treatment was used, though many decry it, having been frightened by the bad results in atoxyl. In the author's opinion this case justifies its use. [The results of treatment in grave conditions are always of interest to practical men, and there could hardly be a graver case than this, yet arsenic did no harm but, it would appear, much good.—A. E. J. L.]

Etiology and Pathology of Retrobulbar Neuritis.—J. H. Parsons² points out that, as differential from functional amblyopia, the lack of sustained constriction of the pupil to light is exceedingly valuable, while subjectively the presence of a central scotoma is by far the most important. He feels sure that empyema of the nasal sinuses is a much overrated cause of the disease.

Retrobulbar Neuritis due to very Moderate Tobacco Smoking.—R. Botey³ reports a case of retrobulbar neuritis in which the sinuses were operated on without result, but in which a cure was achieved when the patient stopped smoking, though he smoked very moderately. [It is well to remember that in certain individuals a very small amount of tobacco may affect the optic nerve. It would seem reasonable to stop it at once in any such case, for a time at least.—A. E. J. L.]

REFERENCES.—¹Congress of Rome, *Clinique Ophtalmol.* 1926, Oct., 605, ²*North-west Med.* 1925, xxiv, 4 (abstr. *Ophthalmic Year Book*, 4); ³*Arch. de Oft. Hispano-Amer.* 1925, 305 (abstr. *Jour. Amer. Med. Assoc.* 1925, 1339).

ORIENTAL SORE. (See also KALA-AZAR.)

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

ETIOLOGY.—G. Panja,¹ of the Calcutta School of Tropical Medicine, reports the production of Oriental sore, after an incubation period of about three weeks, as the result of two intracutaneous injections of a week-old flagellate N.N.N. medium culture of *Leishmania tropica* in a 30-year-old Bengal Mohammedan. S. Adler and O. Theodor² have carried out cross-agglutination experiments, which convinced them that *Herpetomonas papatasi* is identical with *Leishmania tropica*, and is a natural parasite of *Phlebotomus papatasi*, completing the proof that the latter is the natural carrier of cutaneous leishmaniasis. A. Dostrowsky³ records over 100 cases of cutaneous leishmaniasis in Palestine. The localization is on exposed parts of the body, especially on the head and the extensor surfaces of the extremities, which are exposed to insect bites at night, and there is no evidence of direct infection, so the facts support the sand-fly infection hypothesis. S. Adler⁴ describes and illustrates the histology of this disease, and shows that the changes closely resemble those of tuberculosis, including the presence of giant cells and caseation. C. R. Chadwick and C. McHattie⁵ have studied the *canine form* of the disease in Iraq, and conclude that it is common there during the winter but not in the summer months; the parasites do not invade the internal organs, and they are indistinguishable from the human form. Inoculations and treatment both failed.

TREATMENT.—R. L. Varma⁶ has found Oriental sore in the Punjab very refractory to the forms of treatment usually advocated, but he states that in his hands two or three weekly injections of $\frac{1}{2}$ gr. of Berberine Sulphate in 1 c.c. of sterile distilled water into the sores has been uniformly successful in many cases, and he suggests its trial in kala-azar.

REFERENCES.—¹*Ind. Med. Gaz.* 1927, May, 250; ²*Ann. Trop. Med. and Parasitol.* 1926, Dec., 355; ³*Ibid.* 385; ⁴*Ibid.* 407; ⁵*Trans. Roy. Soc. Trop. Med. and Hyg.* 1927, March, 422; ⁶*Ind. Med. Gaz.* 1927, Feb., 84.

OVARIAN FUNCTION.

Beckwith Whitehouse, M.S., F.R.C.S.

The physiology and pathology of the ovary, and the relation which ovarian function bears to menstrual and pathological uterine hæmorrhage, are the subjects of several papers during the past year. Wilfred Shaw¹ has described in considerable detail the *mechanism of ovulation* in the human ovary. This writer leans to the view, supported by Arthur Thompson and Strassmann, that the liquor folliculi is a definite secretion of the 'granulosa' cells of the ripe follicle. It is difficult to understand, however, how these cells receive their nutrition, since at the stage of ripening the 'granulosa' layer is quite non-vascular. The method of approach of the follicle to the surface of the ovary preparatory to ovulation was first described by Strassmann. Shaw calls attention to the importance of the cells of the theca interna layer which proliferate and burrow towards the cortex of the ovary as noted originally by this author. Not only, however, do the theca interna cells proliferate, but also those of the theca externa and stroma immediately in front of the advancing cone of the follicle. Resistance is reduced by vacuolation in these cells, and the result is that the surface of the ovary commonly becomes depressed at the spot where rupture occurs, a point known as the 'stigma'. The stigma itself after rupture of the follicle is immediately closed by a plasma plug, and only for a very short time is there a communication between the cavity of the follicle and the peritoneal cavity. The temporary closure of the stigma is commonly made permanent by hypertrophy of the granulosa cells in the proliferative phase of the corpus luteum. The stigma may, however, be permanently closed by the extension of connective-tissue cells from the ovarian

cortex. Hæmorrhage does not take place into the Graafian follicle either during or after ovulation.

The commonest pathological condition associated with ripening follicles is ovarian hæmatoma, and the most frequent type is that due to hæmorrhage into the theca interna layer. Ovarian hæmatoma is favoured by hyperæmia of the ovary, since under these conditions the capillaries of the theca interna become engorged with blood. There is no hæmorrhage into the cavity of the follicle, the blood being limited by the 'membrana limitans externa'.

W. Shaw,² in another paper, calls attention to certain *pathological forms of the corpus luteum*. At three stages in its development and life history this structure is in a condition of instability. The first of these is at the time of ovulation, when 'granulosa' cells commence to take on lutein characters. The second is when active growth is in progress between ovulation and the nineteenth day of the cycle. The third is when the corpus luteum is changing from the structure which has produced the changes in the uterus preparatory to the embedding of the fertilized ovum, to the lipoid body which probably controls the secondary sex characters of the adult female. Cysts, hæmatomata, and abscess of the corpus luteum occur, as well as various pathological forms containing 'tarry' blood. These 'tarry cysts' may develop a heterotopic epithelial lining which arises by a process of metaplasia from endothelial cells. Occasionally such cysts rupture and the cells become implanted upon adjacent organs in the pelvic cavity. Shaw does not express any definite opinion upon the etiology of these 'tarry cysts' of lutein origin. He thinks it probable, however, that eventually the 'serosal theory' of R. Meyer, the 'adenomyosis theory' of Cullen, and the 'lymphatic metaplasia theory' of Schiller with respect to uterine adenomyomata, may all prove to be branches of some fundamental general theory which incorporates these tarry cysts of the corpus luteum and extragenital endometriomata, without resorting to Sampson's hypothesis of endometrial implantation.

A. S. Parkes³ has studied the effect upon the *œstrus cycle* of destruction of the Graafian follicle by *X-ray sterilization*. He has shown that the complete destruction of Graafian follicles by irradiation of the young female does not inhibit the appearance of the *œstrus cycle* when puberty is subsequently reached. He also found that the cycle in the non-mated adult remained unchanged after sterilization. From these observations he concluded that neither follicles nor corpora lutea are essential to the maintenance of the *œstrus cycle* in the unmated animal. Alternating maturation of Graafian follicles and corpora lutea is not therefore essential for the production of the cyclic *œstral* changes in the accessory sexual organs, and the periodicity of *œstrus* does not appear to be determined by periodic follicular maturation. It seems highly probable that the synchronization of ovulation and *œstrus* is brought about by their being dependent on a common stimulus.

These observations of Parkes are of considerable interest in proving the independence of ovulation and *œstrus*. It should be pointed out, however, that 'synchronization' of ovulation and *œstrus* is not a phenomenon common to all mammalia. In the human species, e.g., ovulation does not occur until the thirteenth to the seventeenth day of the menstrual cycle, i.e., several days after the end of the *œstral* phenomena. We have expressed the view elsewhere⁴ that the *menstrual discharge* or '*lochia*' in the case of '*homo*' is the *clinical manifestation of two separate and distinct factors in the sexual cycle*. It marks the termination of a state of pseudo-pregnancy resulting from the preceding ovulation, and is therefore an afertile abortion. It is also overlapped by the phenomena of pro-*œstrum* and *œstrum*, in preparation for the dehiscence of the next ripening Graafian follicle. Menstruation in the human

female is therefore a complex process characterized on the one hand by molecular necrosis of a useless decidua, and on the other by the local hyperæmia and glandular activity which are the normal concomitants of the pro-œstral state in all animals. Our own investigations have shown that not only destruction or excision of the corpus luteum results in necrosis of the endometrium in forty-eight to seventy-two hours, but that similar trauma to the ripening Graafian follicle also produces a like effect. In other words, the integrity and development of the endometrium require the constant supply of a hormone elaborated in both Graafian follicle and corpus luteum. If this supply is cut off for any reason, then the endometrium necroses at whatever state of development it may be. For this hormone we have suggested the name 'ovarin'. Premenstrual congestion and secretory activity of the corporeal glands of the uterus are produced by the progressive accumulation of another hormone, 'œstrin', present in the liquor folliculi, but also, as shown by Wright and Dodds, in other tissues, e.g., placenta. 'œstrin' is apparently not found in the corpus luteum, and according to the experiments of A. S. Parkes its production is also independent of ovarian follicular activity.

At the present time there appears to be rather a widespread opinion that the œstrus-producing hormone of Allen and D'Oisey⁵ is all-important in the production of menstruation in the human species. We are not prepared to admit that it is more than one factor. 'œstrin' will cause hyperæmia, development, and glandular activity of the uterus, but it does not produce that growth of the endometrial stroma which when completed constitutes the decidua. Decidual development requires the constant stimulus of 'ovarin', present in both follicle and corpus luteum. We have already noted that 'œstrin' cannot be demonstrated in the latter, and yet when the corpus luteum is excised necrosis of the endometrium with hæmorrhage always occurs. This fact appears to provide indisputable evidence of the independence of 'ovarin' and 'œstrin'. Both hormones are important for the economy of the individual and the maintenance of the species, but each subserves a separate function.

The importance of these recent views on ovarian function and menstruation lies in the bearing that the facts have upon the causation of irregular uterine hæmorrhage. If necrosis of the endometrium with bleeding results from experimental trauma to the ripening Graafian follicle or the corpus luteum at any stage in its development, it is only reasonable to suppose that lesions produced by disease will have a similar effect. Follicular hæmatomata and tarry cysts of the corpus luteum, such as those described by W. Shaw, are commonly found in association with pelvic inflammation, uterine fibromyomata, and prolapse of the ovaries into Douglas's pouch. It is therefore almost certain that the irregular uterine bleeding (metrostaxis) so commonly associated with these conditions finds its explanation in defective ovulation. This is also probably the reason why sterility and irregular and profuse menstrual periods are so commonly associated. The uterus, in other words, is merely the mirror of ovarian activity. In the past it has indeed probably suffered many grievous assaults from being in bad company!

REFERENCES.—¹*Jour. Obst. and Gynecol. Brit. Empire*, 1927, Autumn, No. 3; ²*Ibid.* xxxiv, No. 2; ³*Proc. Roy. Soc.*, B, c and ci, 1926-27, and *Jour. Physiol.* 1927, LXI; ⁴*Lancet*, 1927, June 18, 1275; ⁵*Jour. Amer. Med. Assoc.* 1925, Aug. 8, 399.

PANCREAS, DISEASES OF.

A. Rendle Short, M.D., F.R.C.S.

Injuries.—Couboulès¹ has had two cases, one developing a post-traumatic cyst, and the other a pancreatic fistula discharging through the operative wound made for intraperitoneal hæmorrhage.

Acute Pancreatitis.—Several papers, by Mark Kaufmann,² McNeill Love,³

D. Chamberlain,⁴ I. Abell,⁵ and Hamilton Bailey,⁶ deal with this condition. The cause is still in doubt. Kauffmann rejects the theory that it is due to infection from the lymphatics, because he has been unable to induce pancreatitis in animals by infecting the near-by lymphatic glands. On the other hand, Chamberlain favours this theory, because he declares that there is a valve guarding the opening of the pancreatic duct to prevent the influx of bile or of intestinal contents, and though the bile usually contains streptococci in these cases, the common bile-duct does not look inflamed. An experienced surgeon nowadays will often make a confident pre-operative diagnosis. The extreme severity of the pain, unmatched in any other abdominal catastrophe, the cyanosis, and the associated looseness of the bowels, sufficiently distinguish a typical case from other acute abdomens. Of course the onset is often quieter and less recognizable. In some cases—9 out of 51 at the London Hospital (Love)—a swelling may be felt, usually fluid in the lesser sac. Bailey states that in 4 cases out of 5 under his care Loewi's test was positive. It can be quickly performed; four drops of 1-1000 adrenalin is put in one eye and repeated in five minutes. In half an hour, if the pancreas is diseased, the pupil dilates widely.

The treatment must be **Operation**. In the experience of the reviewer the ultra-acute cases do best, because there is no delay. At Leeds, 8 died out of 21 (Chamberlain); at the London Hospital, 22 died out of 51, but 4 of these were too ill to be operated on. These results are much better than they were some years ago. The best results are given by drainage of the peritoneal cavity down to the pancreas, and the worst by incision of the pancreas. Drainage of the gall-bladder is intermediate (Love). Posterior drainage is difficult, but seems reasonable. Patients who survive may yet meet with further trouble, which is not surprising when one sees the huge sloughs that may come away from the pancreas. They may die of hæmorrhage at this stage. Of 25 followed up, no less than 16 had further attacks of pancreatitis (Love). The reviewer has found that patients get violent headaches if they take fats. Probably some develop diabetes, but it is not recorded in any of the papers before us.

Pancreatic Cysts.—J. Friedenwald and T. S. Cullen⁷ present a study of 7 cases. In 25 per cent of the cases they follow trauma. The patients are usually middle-aged. The contained fluid is sometimes clear but often blood-stained. There is a history of indigestion and colic, passing later into pain and perhaps vomiting, with constipation and loss of flesh. The cyst can generally be felt, most often to the left of the mid-line in the upper abdomen. The surface is smooth. It may fluctuate. Sometimes sudden painful distention of the cyst occurs from hæmorrhage into it. The X ray gives help, showing the stomach pushed aside. In 3 cases out of the 7 malignant degeneration took place. The treatment is **Removal**, which is not often possible, or **Drainage** after excising as much as possible; the latter is very safe, but the irritating discharge may persist.

The treatment of pancreatic fistulæ is discussed by Sènèque.⁸ Medical and dietetic treatment may be effectual in obtaining a cure. A strict **Anti-diabetic Diet** is given, with **Bicarbonate of Soda** by mouth, and **Atropine** hypodermically. Two cases are on record in which **X rays** were successful in getting the fistula to close. In five cases at least, it has been turned into the stomach with a good result, and several times into the first coil of the jejunum.

REFERENCES.—¹*Lyon chir.* 1926, xxiii, 91; ²*Surg. Gynecol. and Obst.* 1927, Jan., 15; ³*Lancet*, 1926, ii, 1262; ⁴*Brit. Jour. Surg.* 1927, xiv, Jan., 390; ⁵*Ann. of Surg.* 1926, Oct., 561; ⁶*Practitioner*, 1926, Aug., 122; ⁷*Amer. Jour. Med. Sci.* 1926, Sept., 313; ⁸*Presse méd.* 1926, Nov., 1492.

PARALYSIS, GENERAL. (*See* DEMENTIA PARALYTICA.)

PARALYSIS, INFANTILE. (*See* POLIOMYELITIS, ACUTE.)

PARALYSIS, PSEUDOHYPERTROPHIC MUSCULAR. (*See* MYOPATHY, PSEUDOHYPERTROPHIC.)

PARALYSIS, TENDON TRANSPLANTATION FOR.

E. W. Hey Groves, M.S., F.R.C.S.

It is somewhat remarkable how very varying are the possibilities of good functional results from tendon transplantation. In the upper limb, and particularly muscles of the fingers and hands, tendon transplantation has given a most gratifying measure of success. In the case of a foot, however, such an operation so often leads to disappointment that it has been almost abandoned. Probably this is due to the fact that the weight-bearing functions of the foot cannot be sustained by the new tendon. In infantile paralysis affecting the lower limb the most serious disability is caused by the loss of the action of the glutei. Whereas all other lost actions of the leg can to some extent be made good by apparatus, the paralysis of the gluteal muscles makes it impossible for the patient to support the body on the lower limb, and he is therefore dependent upon the use of crutches. Of late years various operations have been suggested to make good this gluteal paralysis. The first of these, and the one which has had the greatest vogue, is Legg's operation by which the tensor fasciæ femoris has its tendon inserted into the base of the great trochanter. More recently F D. Dickson¹ has elaborated Legg's operation by bringing the tensor muscle through a tunnel on the outer side of the trochanter and attaching it to a groove cut in the crest of the ilium. Kreuscher² has proposed to utilize the strong muscle of the erector spinæ as an abductor of the hip. This muscle is much more powerful than the tensor fasciæ femoris, but its use is open to the objection that an artificial tendon of silk has to be made in order to bridge the gap between the erector muscle and the trochanter.

Hey Groves³ has suggested that a more efficient operation than either of these may be performed in such a way as to utilize both the tensor fasciæ femoris and the erector spinæ. A long incision is made on the outer side of the thigh from the tip of the great trochanter down to the knee; through this the iliotibial band is exposed, isolated, and cut through near the knee-joint. The fascia lata is stripped up until the tensor fasciæ femoris is exposed. The strip of fascia is taken backwards through a tunnel made through the origin of the vastus externus muscle at the base of the great trochanter. A separate incision is made over the lower part

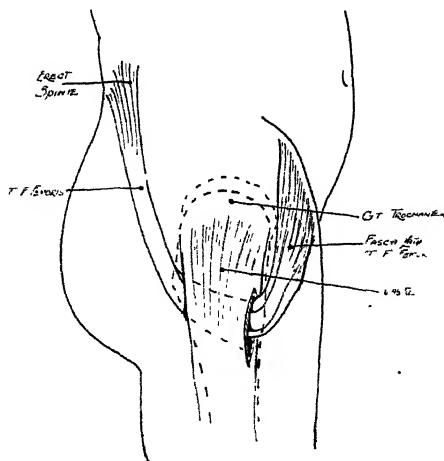


Fig. 10.—Diagram of the new abductor muscle of the hip seen from the side. (By kind permission of the *British Journal of Surgery*.)

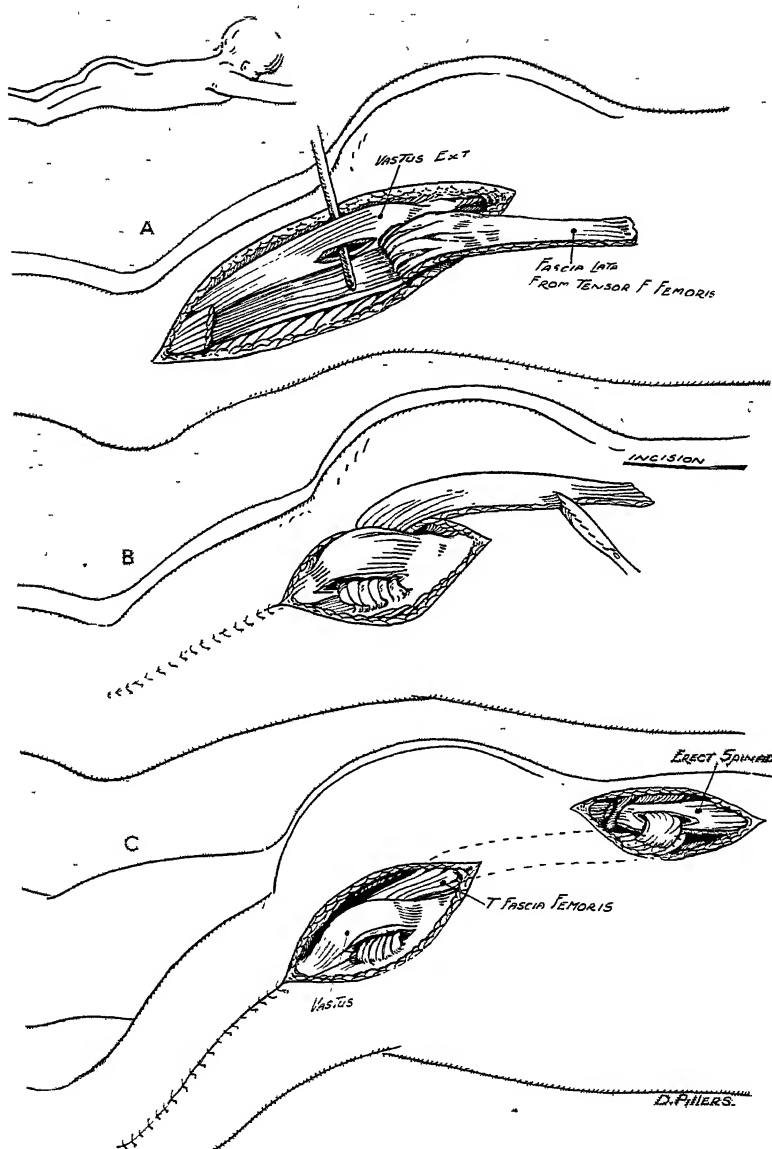


FIG. 71.—Groves' operation for making a new abductor muscle for the hip. Inset, position of the child and incision. A, Thigh operation; the iliotibial band is isolated and divided at its lower end. A tunnel is prepared for the new tendon at the base of the great trochanter under the upper part of the origin of the vastus externus. B, A great part of the incision is closed; the iliotibial band has been brought through the tunnel at the base of the trochanter. C, The superficial part of the erector spinae has been exposed and isolated; the iliotibial band has been drawn upwards and backwards under the skin and attached to the erector muscle. (By kind permission of the 'British Journal of Surgery'.)

of the erector spinæ of the same side, and the superficial portion of this muscle, together with its strong investing fascia, isolated. The free end of the fascia lata is now brought up into the incision over the back through a tunnel in the subcutaneous tissue; the free end is brought through a button-hole incision in the erector spinæ, and sewn over in the form of a loop. In this way a new abductor of the hip is formed, which consists of a two-bellied muscle, the tensor fascia femoris in front and the erector spinæ behind, with the fascia lata as an intermediate tendon. (Figs. 70, 71.)

REFERENCES.—¹*Jour. Bone and Joint Surg.* 1927, Jan., 1; ²*Surg. Gynecol. and Obst.* 1925, May, 593; ³*Brit. Jour. Surg.* 1927, xiv, Jan., 486.

PARALYSIS OF THE THUMB.

E. W. Hey Groves, M.S., F.R.C.S.

Paralysis of the intrinsic muscles of the thumb is a most serious disability for all those who have to carry out skilled movements. H. H. M. Lyle¹ describes a modification of operations which have been previously suggested by Steindler and Ney. The object of this operation is to restore the adduction and pincer action to the paralysed thumb. In the first place the tendon of the extensor brevis pollicis is fully exposed and cut through, just below the annular ligament. This tendon is then brought round to the front of the hand, passed under the annular ligament, and sewn to the tendon of the flexor carpi radialis or to that of the palmaris

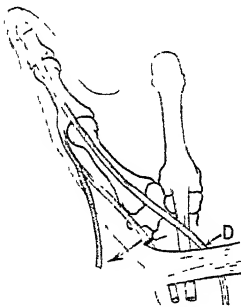


Fig. 72.

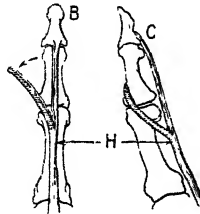


Fig. 73.

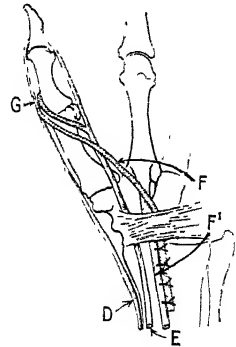


Fig. 74.

Fig. 72.—Dorsal view, showing extensor brevis pollicis exposed and cut away, as indicated by the arrow. D, Extensor longus pollicis. (Figs. 72-74 re-drawn from 'Annals of Surgery'.)

Fig. 73.—S, Palmar, and C, Lateral view, showing flexor longus pollicis sheath opened, and the outer half of the tendon freed and sutured into the external surface of the first phalanx of the thumb. H, Flexor longus pollicis.

Fig. 74.—Palmar view, showing completed operation. The distal cut end of the extensor brevis pollicis is passed through the subcutaneous tissue of the thenar eminence to the distal margin of the annular ligament, then under the ligament, and attached to the tendon of the flexor carpi radialis. D, Extensor longus pollicis; E, Flexor longus pollicis; F, Transplanted tendon of extensor brevis pollicis, sutured to F'. Flexor carpi radialis. G, Slip from flexor longus pollicis inserted into outer side of base of first phalanx.

longus, if the latter is well developed. In addition to this, half the thickness of the flexor longus pollicis is divided from near the termination of that tendon, brought round to the back of the thumb, and fixed to the dorsal surface of the first phalanx. Lyle states that this operation has enabled a patient, who was a wood-carver and who had been obliged to give up his occupation on account of senile paralysis, to return to work, which he has been able to follow for two years after the operation.

REFERENCE.—¹*Ann. of Surg.* 1926, Aug., 288.

PARATYPHOID FEVERS. (*See also* TYPHOID FEVER.) J. D. Rolleston, M.D.

ETIOLOGY.—L. Abramson¹ states that during an epidemic of about 360 cases of paratyphoid B fever in the summer of 1925, and another small outbreak of the disease in the following summer at Gotenburg, 16 female patients of ages from 8 to 63 were found to be carriers—14 of *B. paratyphosus B* and 2 of *B. typhosus*. Examination of the urine showed that typhoid or paratyphoid bacilli might occasionally be found in vulvar smears, and that urine evacuated spontaneously might sometimes contain these organisms, while catheter specimens were always free from them. The bacilli had probably reached the vulva from the anus, and the urine evacuated spontaneously had become infected in its passage through the vulva. The practical significance of this finding is that owing to the much greater frequency with which the bladder is evacuated in contrast with the bowels, the likelihood of infection is considerably increased.

SYMPTOMS AND COMPLICATIONS.—F. Goebel² states that paratyphoid fever is by no means rare *in infancy*, although only about a hundred cases have been reported, usually in the form of small epidemics (*see* MEDICAL ANNUAL, 1920, p. 266; 1923, p. 341). The clinical picture varies, but is always accompanied by fever and usually by diarrhœa, which is often of a dysenteriform character. The course of paratyphoid fever in infants is usually mild. Epidemics, as a rule, are confined to a small area, and the mortality does not exceed 10 per cent. The disease is often undoubtedly not recognized, but mistaken for an ordinary acute nutritional disturbance, so that infants may easily be the cause of an outbreak. In the sporadic attacks and epidemics of paratyphoid fever on record the source of infection has frequently not been discovered. In those instances in which it has been detected, it has always been traced to the mother or nurse, who was either a carrier or actually suffering from the disease. Goebel reports an outbreak of 7 cases of febrile diarrhœa in infants with blood and mucus in the stools. The attacks were of extraordinary severity and proved refractory to all treatment, death taking place in six of the seven cases from the fifth to twelfth day of the disease. The outbreak was found to be due to consumption of milk contaminated with *B. paratyphosus B* of the Breslau type. Post-mortem examination showed the characteristic lesions of paratyphoid B, viz., only a slight inflammation of the mucous membrane of the small intestine and a moderate swelling of the mesenteric lymphatic glands. To avoid similar outbreaks, Goebel recommends that all bottle milk should be sterilized after delivery, even if it has been previously pasteurized in the dairy, the loss of vitamins being made up for by administration of fruit-juices.

P. Delanoe and A. Paoletti³ record two instances in husband and wife of *gastro-intestinal infection by B. paratyphosus B* due to consumption of contaminated sausages. The husband had a sharp attack of vomiting, diarrhœa, and fever, which set in about four hours after eating the sausages and ceased abruptly on the fourth day. The wife, on the other hand, after an incubation period of about eight days, during which she showed signs of alimentary intoxication only without fever, developed an attack of paratyphoid fever B which lasted about a week. The feces were still found to contain a pure culture of *B. paratyphosus B* forty days after they were first examined.

P. Cordua and E. A. Keck,⁴ who have collected fourteen cases from the literature in which typhoid bacilli were found in ovarian abscesses, report the first case on record of an *ovarian abscess due to B. paratyphosus B*. The patient, who was 36 years old, developed severe abdominal pain in the fourth week of paratyphoid fever. On laparotomy an abscess containing paratyphoid B bacilli was found in the chronically inflamed left ovary. The writers also describe a case in a woman of 32 who had a chronically inflamed right ovary

containing an abscess removed. Paratyphoid B bacilli were found in the pus, though there was no previous history of paratyphoid fever.

J. Jacobi³ reports a case of *sudden death* in paratyphoid B fever. The patient was a girl, age 17, who suddenly developed severe collapse and dyspnoea in convalescence and died in a few minutes. The necropsy showed thrombosis in the left femoral vein and embolism of the main branches of the pulmonary artery. The femoral thrombus had not given rise to any symptoms during life.

F. Reiche⁴ reports two cases of *pernicious anæmia* associated with protracted *paratyphoid B*. One was in a woman, age 45, who was already suffering from pernicious anæmia when she contracted paratyphoid, while the other was in a man of 50. Both cases were fatal, and the characteristic lesions of enteric were found in the intestine post mortem. Although simple anæmia which may be slow in clearing up is a usual accompaniment of severe enteric, no previous instance has been recorded of pernicious anæmia as a sequel of the disease.

REFERENCES.—¹*Zentralbl. f. Bakteriolog.* 1927, cii, 309; ²*Arch. f. Kinderheilk.* 1927, lxxx, 181; ³*Arch. de l'Inst. Pasteur de l'Algérie*, 1926, 575; ⁴*Zentralbl. f. Gynäkolog.* 1926, 2747; ⁵*Med. Klinik*, 1927, 316; ⁶*Deut. Arch. f. klin. Med.* 1926, clii, 1.

PELLAGRA.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

J. B. Guthrie¹ discusses the *hydrochloric acid in the stomach contents* in pellagra, and records that in his experience of 35 female cases he found a larger proportion with entire absence of the acid than others have done; he regards this as of diagnostic value, but disagrees with Johnson in not attributing to it any prognostic value. G. M. Niles² discusses treatment in a hopeful vein, and he considers that in those under 55 years of age, and without pronounced mental symptoms, a reasonably hopeful prognosis may be given under the following lines: The Diet should be nourishing and contain meats, eggs, milk or buttermilk, and vegetables, especially beans and peas, but alcohol should be avoided. Among hygienic measures he advises rest, avoidance of the sun's rays, and for the buccal infection injections of $\frac{1}{2}$ -gr. doses of Emetine daily for six days at a time, and the application of Silver Nitrate to ulcers. Among medicinal measures he is in favour of injections of Sodium Cacodylate, and internally a mixture of Fowler's Solution and a saturated solution of Potassium Iodide, and dilute Hydrochloric Acid when that substance is deficient in the gastric juice. Only castor oil and enemas should be used for constipation. Calamine and Zinc Oxide powder in lime-water, or as an ointment with lanolin is advised for the erythema, and nerve sedatives or opium for sleeplessness and melancholia. Change to a cooler climate or a higher altitude during the summer months is of value when possible, and hot weather should be avoided for some months after recovery.

REFERENCES.—¹*Amer. Jour. Trop. Med.* 1926, Sept., 357; ²*Med. Jour. and Record*, 1927, April 20, 513.

PELVIC INFECTION.

Beckwith Whitehouse, M.S., F.R.C.S.

TREATMENT.—The treatment of inflammatory conditions of the uterine adnexa was discussed at the sixth British Congress of Obstetrics and Gynaecology in Manchester in April, 1927. Aleck Bourne,¹ in considering acute gonorrhœal salpingitis, stated that in his opinion it is advisable to operate at an early stage in all cases where suppuration has occurred. The operation of choice is Salpingostomy with efficient drainage. If the Fallopian tube is beyond hope of repair and possible function, salpingectomy is indicated. As soon as possible after subsidence of the acute symptoms, treatment of the uterine cavity should be commenced by means of Hobbs' Glycerin Injections. Bourne

considers that early operation for acute suppurative salpingitis prevents permanently thickened tubes, and chronic pyosalpinx, with the common clinical history of persistent pelvic abdominal pain, menorrhagia, and leucorrhœa. The figures, however, which he submits in support of his contentions are not very convincing. In a series of 17 cases of salpingostomy for acute salpingitis the majority of the patients had a normal temperature within a week. Two, however, were febrile for a month, and in one case a sinus persisted for nearly four weeks. Of 9 women examined a year or two after operation, 7 complained of menorrhagia with or without menstrual pain. Three confessed to intermittent or general pain in one or other iliac fossa. No case of pregnancy could be traced after the operation, but on the other hand, in the cases examined, no pelvic swelling, induration, or fixity could be felt.

Beckwith Whitehouse,¹ discussing the 'expectant treatment of pelvic inflammation', observed that the initial mortality is low when surgical intervention is deferred to a later date. There is a strong probability that operation will be eventually required in the majority of cases of severe infection, but it is best undertaken at a time when such intervention is safe and with the lowest mortality. The results of combined expectant and conservative measures are good, if by that is understood the production of an individual who is subsequently able to carry out her functions, social and marital, in a normal manner and with comfort to herself. Fertility is impaired whatever treatment is adopted, although not by any means destroyed. It is naturally least impaired when the surgical measures employed are of the simplest and least complicated type. Drainage is the simplest of all procedures, and this should be by the vaginal route when possible. Approach to the pelvis by the abdominal route appeared to the writer to be a dangerous undertaking in the presence of acute inflammation.

In a series of 55 cases of salpingitis in which, as the result of previous expectant treatment, it was subsequently only necessary to remove one uterine appendage, 21·8 per cent became pregnant. In one case a patient after losing one appendage had five children, and another patient had four. One case of pregnancy occurred after removal of both Fallopian tubes. In a series of 26 cases of pelvic abscess treated only by drainage, 11·5 per cent of the patients subsequently became pregnant, and in all instances the gestation successfully went to term.

A. H. Curtis¹ stated that since 1921 his policy in Chicago had been one of 'absolute clinical conservatism' in dealing with gonorrhœal lesions of the uterine adnexa. Operations for the purpose of eradication of infections of the Fallopian tubes had been discontinued almost entirely. Surgery was employed, and frequently; but it was reserved chiefly for such sequelæ of disease as adhesions with symptoms, sterility, painful displacements, and excessive menstruation. A single attack of salpingitis, according to Curtis, seldom results in marked permanent increase in thickness of the wall of the Fallopian tube. Greatly thickened Fallopian tubes are almost pathognomonic evidence of repeated salpingitis, and occur chiefly in prostitutes or women whose husbands are carriers of infection. In a detailed laboratory investigation of 200 pairs of thoroughly ground Fallopian tubes it was hardly ever possible to obtain the gonococcus longer than two weeks after disappearance of fever and leucocytosis.

S. J. Cameron¹ referred to the importance of the prevention of intestinal adhesions after operations for pelvic inflammation. Adhesions are the cause of much subsequent pelvic pain, and therefore every care should be taken to obliterate raw surfaces. The surgeon who delays the operation of salpingo-oöphorectomy until the acute stage has subsided for a few weeks is less troubled with adhesions than he who attempts to excise or suture structures which are

in a state of subacute inflammation. Cameron therefore advocates simple drainage of the pelvic cavity by an incision in the posterior vaginal fornix while the lesion is acute. Further surgical intervention is deferred until all the acute symptoms and signs have disappeared.

Blair Bell² is of opinion that conservation of the ovarian function should be a fundamental principle in the surgical treatment of salpingitis, and he condemns indiscriminate 'clean-sweep' operations as 'surgical sacrilege'. Whenever feasible the ovary should be left in its normal position and with its natural connections. Interference with the ovarian blood-supply, however, is commonly followed by cyst formation, and therefore, if removal of a Fallopian tube produces trauma to the ovarian artery, the interests of the patient are probably best served by detaching the ovary and inserting grafts, either into the ovary, or the uterine wall as suggested by Estes and Tuffier. By the conservation of ovarian tissue with an adequate blood-supply its internal secretion and menstruation are preserved.

Bethel Solomons¹ advocates the adoption of Salpingostomy or Tubal Grafting in chronic salpingitis with a view to the cure of sterility. Cases are divisible into four classes. The first and most favourable type is Class 1, where adhesions only are present at the fimbriated end of the Fallopian tube. In 72 cases in which adhesions were divided, the lumen of the tube demonstrated, and a strand of No. 2 catgut inserted, there were subsequently 32 pregnancies. In Class 2, where it was necessary to resect the fimbriated end of the Fallopian tube, 6 pregnancies occurred in a series of 25 cases. Class 3 includes cases of disease at the isthmus of the Fallopian tube. Here Solomons resects the diseased portion of the tube and performs an end-to-end anastomosis at the uterine cornu. In a series of 15 cases in this class, one uterine pregnancy and two tubal pregnancies subsequently occurred. Class 4 is constituted by cases of inflammatory disease at the uterine end of the Fallopian tube. The uterus is bisected and the diseased portion of the Fallopian tube removed. The blunt end of a straight needle is passed, eye foremost, into the uterine cavity to show direction. It is threaded with No. 2 catgut and the latter is knotted in the uterine cavity. The catgut is carried through the lumen of the tube, which is then united to the uterus by means of interrupted sutures of fine catgut. In 24 cases where this operation was performed, 8 pregnancies subsequently occurred. Two of the patients went to term, and one gestation ended in abortion at the third month.

REFERENCE.—¹*Jour. Obst. and Gynaecol. Brit. Empire*, xxxiv, No. 2.

PELVIS, CONTRACTED. (*See CONTRACTED PELVIS.*)

PERI-ARTERIAL SYMPATHECTOMY. (*See VASCULAR SURGERY.*)

PERICARDITIS.

A. G. Gibson, M.D., F.R.C.P.

H. N. Ets¹ puts in a plea for earlier and more frequent aspirations in pericarditis with effusion, and emphasizes it by relating the histories of four patients, all of whom died suddenly, death being supposed in these cases to have been due to increased pressure. He draws attention to the fact that pressure in the pericardial sac is the real criterion of the danger, proportional not to the size of the exudate but to the rapidity of its formation. A steady fall in the arterial pressure or a sudden acceleration in the rate of decline is an urgent indication for therapeutic puncture. This may be done either in the angle formed by the seventh costal cartilage with the xiphoid cartilage, or in the fifth space just internal to the outer border of the pericardial dullness.

REFERENCE.—¹*Arch. of Internal Med.* 1926, Aug., 206.

PERITONITIS.*A. Rendle Short, M.D., F.R.C.S.*

A surgical congress held at Berlin¹ last year discussed this subject very fully, no less than twenty-three speakers from all over Germany and Austria taking part. There as here the death-rate in cases of diffuse suppurative peritonitis is not so high as it used to be. A study of a large body of statistics showed that the mortality in peritonitis from appendicitis is 35 per cent, from gastro-intestinal perforation 58 per cent, and post-operative peritonitis 100 per cent. The lines of treatment are not dissimilar from the common practice in this country, but certain clinics have customs of their own. Some practise Intra-peritoneal Lavage, and a variety of fluids are used for the purpose, such as hydrochloric acid and pepsin. According to L. Schönbauer,² the formula at von Eiselsberg's clinic at Vienna is :—

R	Acid. Hydrochlor. Dil.	4·5	|	Pepsin
	Aq. Dest.	1500·0		

It is claimed that the use of this fluid reduced the death-rate in cases of peritonitis from appendicitis, perforation of gastro-duodenal ulcer, etc., from 34·8 per cent in 164 cases to 12·8 per cent in 117 cases.

Several German clinics have given up the Fowler position because they feel that intraperitoneal fluids are so soon shut up by adhesions that they are not free to fall into the pelvis. Morphia is given, "the sovereign remedy for sparing the heart". Other clinics greatly favour intravenous Sodium Chloride with Pituitrin. At Greifswald, Pels Leusden differs from the usual German practice in that he does not operate for peritonitis unless the cases come under treatment on the first day of the peritonitis. Of 106 operated on, 75 per cent died; of 32 treated conservatively, only 59 per cent died. The other surgeons present dissented vigorously. S. Solieri (Italy)³ reports favourably of the introduction of Colloidal Silver into the peritoneum. B. W. Williams⁴ believes that the toxæmia of peritonitis, as of intestinal obstruction, is due to poisons derived from *B. welchii*, and that the proper treatment is to give Anti-gas-gangrene Serum (see *INTESTINES, SURGERY OF*, p. 239). It is claimed that this has reduced the death-rate from appendicitis from 6·3 to 1·17 per cent at St. Thomas's Hospital. C. D. Brooks,⁵ and also J. W. Long,⁶ call attention to the value of Enterostomy, especially in cases of pelvic peritonitis, to give time for the bowel to recover. It is easy to slip a rubber tube into the small intestine or the cæcum, by the Witzel technique, or through the stump of the appendix. If omentum is wrapped around, the hole will close without trouble.

REFERENCES.—¹50 *Tag. d. Deut. Ges. f. Chir.*, Berlin, 1926; ²*Zentralbl. f. Chir.* 1926, Nov., 2834; ³*Polichinico* (Séz. Prat.), 1927, Feb. 14, 235; ⁴*Brit. Jour. Surg.* 1926, xiv, Oct., 295; ⁵*Surg. Gynecol. and Obst.* 1926, Sept., 372; ⁶*Ibid.* July, 61.

PERITONSILLAR ABSCESS. (*See* TONSILS, DISEASES OF.)**PERNICIOUS ANÆMIA.***Ivor J. Davies, M.D.***ETIOLOGY AND DIAGNOSIS.**

Anæmia and Vitamin Deficiency.—K. K. Koessler, S. Maurer, and R. Loughlin¹ investigated the relationship of anæmia, primary and secondary, to vitamin A deficiency. The vitamin theory of Addison's (pernicious) and other severe anæmias which formed the basis of their experimental and clinical inquiry is thus expressed: (1) The blood changes and the changes in the gastro-intestinal tract may be due to vitamin A under-feeding over a long period of years. (2) The nervous symptoms might be related to an absence or deficient quantity of vitamin B. (3) The tendency to hæmorrhages found in severe anæmias may be due to the partial or complete lack of vitamin C. This theory

does not assume to invalidate the importance of bacterial poisons for the pathogenesis of pernicious anæmia. The tissue changes brought about by the chronic vitamin deficiency may facilitate the action of these poisons.

With these considerations in mind, as well as other clinical observations, an attempt was made to learn whether a condition similar to human pernicious anæmia might be produced in experimental animals, by causing protracted vitamin deficiency under suitable conditions. Rats, while in a state of chronic vitamin A deficiency, develop a severe anæmia, which, after ample vitamins are added to the diet, shows the typical blood picture of an early Addison's anæmia, characterized by all the features of rapid blood regeneration. Their conclusions are as follows: (1) Blood regeneration cannot take place without the presence of vitamin A. (2) The addition of vitamin A to the diet of animals, long depleted in their vitamin A reserve, brings about rapid formation of new blood-cells. (3) The rate and intensity of the blood regeneration is a function of the quantity of vitamin A added. (4) A condition similar to human pernicious anæmia has been produced in experimental animals. (5) A definite relationship exists between a state of chronic vitamin deficiency and certain anæmias. (6) The routine use of a rationally balanced diet which has proved itself thus far of decided value in the blood regeneration of patients suffering from severe anæmias, aplastic as well as erythroblastic, is the most promising procedure in the treatment of certain anæmias, especially pernicious.

Gastric and Neurological Relationships to Pernicious Anæmia.—S. E. Dorst,² writing on familial pernicious anæmia, discusses an unusual group of cases with a consideration of *achlorhydria* as the dominant etiological factor. A family group is reported where a mother of four children (three daughters and one son) died of Addison's anæmia, and among six other members of the family examined only two had a normal gastric secretion; two had a complete *achlorhydria*, and two had a very marked *hypochlorhydria* closely approaching an *achlorhydria*; none of these latter members of the family, ranging from 19 to 54 years of age, showed an abnormal blood picture. Four of this family group of Addison's anæmia showed *subacute combined sclerosis of the cord*, and in two of these Hunter's glossitis was associated. Dorst recommends that all members of a family in which Addison's anæmia has been found should be thoroughly examined, and a gastric analysis made, in order that the administration of large doses of dilute hydrochloric acid may be started at once in those who have *hypochlorhydria* or *achlorhydria*. A review of the literature on the familial occurrence of Addison's anæmia and its relation to constitutional *achylia gastrica* is given in his paper.

A. F. Hurst³ makes a further contribution on the *achlorhydria* of the Addison's (pernicious) anæmia—*subacute combined degeneration of the cord*—Hunterian glossitis syndrome. In previous papers Hurst has shown that the *achlorhydria* which is constantly present in Addison's anæmia and *subacute combined degeneration of the cord* is an essential predisposing cause, and not a result, of the disease; also that in many cases the *achlorhydria* is a result of constitutional *achylia gastrica*, an inborn and often familial error of function, which results in complete suppression of the secretion of gastric juice in spite of the apparently normal structure of the mucous membrane. *Achlorhydria* due to other causes may equally well predispose to the development of the disease, as in chronic alcoholic gastritis, cancer of the stomach where no secondary deposits were subsequently found in the bone-marrow after gastrectomy performed for carcinoma, and lastly after gastro-enterostomy, owing to the neutralization of the gastric contents by the alkaline juices of the duodenum and the rapid drainage of the stomach.

The present paper is an attempt to discover the relative frequency of constitutional achylia gastrica and secondary achlorhydia as the predisposing cause of Addison's anæmia and subacute combined degeneration of the cord. The question is one of great practical importance, as it should be possible to restore the secretion of gastric juice in some, at any rate, of the cases of secondary achlorhydia by suitable treatment, and the normal secretion of acid would clearly be of far greater value than the permanent administration of large doses of hydrochloric acid in first overcoming and then preventing the recurrence of intestinal infection in patients with Addison's anæmia and the associated conditions. An analysis is made of 37 consecutive cases of the 'Addison's anæmia—subacute combined degeneration of the cord—Hunterian glossitis syndrome'. Hurst concludes that out of 37 cases, 10, or 27·2 per cent, gave a family history of Addison's anæmia, so that their achlorhydia was almost certainly due to constitutional achylia gastrica; 6 others, or 16·2 per cent, gave a history which strongly suggested that the achlorhydia was a sequel of acute gastritis and was not constitutional. In many of the remaining 21 cases, the achlorhydia was probably due to constitutional achylia gastrica, as it is obvious that in only a proportion of such cases would more than one of the members of the family who had achylia develop Addison's anæmia or subacute combined degeneration of the cord. It is interesting to note that there was no overlapping between these two sets of cases, none of those with a family history giving a history suggestive of acute gastritis, and none of the gastritis cases giving a family history of anæmia.

In the same publication M. E. Shaw⁴ publishes a case of apparent recovery from Addison's anæmia and the associated achlorhydia. The patient has remained perfectly well with a hæmoglobin percentage within the normal limits for nearly three years, and the secretion of hydrochloric acid in his stomach has returned, although, on admission, he had the usual complete achlorhydia. The diagnosis of a case of Addison's anæmia made at Guy's Hospital cannot be questioned. Shaw discusses the alternative question of a prolonged remission. The length of time that the patient has remained in perfect health with a normal hæmoglobin percentage (about three years) is certainly much longer than the average remission in a typical case of Addison's anæmia. Cabot's analysis of 524 cases quoted in Osler's text-book gives a duration of three months to four years for the remissions. In the same investigation the figures for complete recovery are given as 6 out of 1200 cases. These figures are open to the objection that they were compiled at a time when the diagnosis of the disease was based almost exclusively upon the clinical features and the appearance of the blood film, and when the more recent diagnostic methods, upon which we mainly rely at the present time, were unknown. In a more recent investigation of 101 cases by Maitland Jones the average duration of the remissions is given as six months. (*See also* ACHYLIA AND ACHLORHYDRIA.)

A. L. Skoog⁵ reports a case of combined sclerosis of the cord and discusses the neurological manifestations in pernicious anæmia. He offers a new conception in etiology—that the disease arises from physiological or pathological changes in the vegetative nervous system, especially the solar plexus; the derangement being purely physiological at its inception, resulting in achlorhydia and other changes in the alimentary tract. He also believes that continuous emotional strains resulting from anxiety and worry are potent factors in the early etiology. The sympathetic nervous system and the endocrine system should always be examined as a part of the complete pathological investigation.

R. R. Grinker,⁶ in an analysis of 74 cases of pernicious anæmia to ascertain the relationship between the disease and *achylia gastrica* and *combined*

degeneration of the cord, draws the following conclusions: (1) Normal gastric acidity may be present in pernicious anæmia. (2) The rarity of achylia preceding the anæmia by many years makes it improbable that achylia is a predisposing cause. The fact that the anæmia may go unrecognized for some time may account for these cases. (3) There is no evidence that there is an intestinal infection in pernicious anæmia, or that streptococci lying latent in the bowels of these patients are the producers of absorbable toxin. (4) Thirty per cent of pernicious-anæmia patients develop definite signs of combined cord degeneration. (5) Combined cord degeneration may be caused by the hypothetic toxins producing the pernicious anæmia or developing during the course of the disease, but may also be the result of numerous other toxic conditions, such as Addison's disease, carcinoma of the bowel, pellagra, arteriosclerosis. (6) Eight per cent of patients having paræsthesia as the initial complaint developed cord degeneration, while only 20 per cent developed cord degeneration when paræsthesia appeared during the course of the disease. The incidence of cord degeneration in Addison's anæmia differs considerably in the reports of various authors. Bramwell⁷ and Nonne⁸ put the figure at 2 per cent, McCrae⁹ 25 per cent, Hurst 70 per cent, Woltmann¹⁰ 80 per cent. It is important, as Grinker states, to know the clinical criterion of cord involvement, as Woltmann accepted the presence of tingling and numbness as being diagnostic of involvement of the central nervous system. Such paræsthesias are often present in cases of severe secondary anæmia, and are of peripheral-nerve origin. Grinker restricts the evidence of cord affection to definite objective signs, such as changes in the reflexes, and sensory changes due to lesions of the long root fibres of the posterior columns.

Cardiac Symptoms.—Carey F. Coombs¹¹ contributes a note on pernicious anæmia with particular reference to cardiac pain. He draws attention to two facts, the first being the simulation of cardiac disease by pernicious anæmia in the early stages; and secondly, that among the symptoms of myocardial disease sometimes shown by the patient with pernicious anæmia, cardiac pain has a place. These observations were based upon a study of 86 consecutive cases of the disease. Coombs alludes to a paper by Herrick and Nuzum¹² as the only other reference to cardiac pain in pernicious anæmia.

Colour of the Blood Serum.—The value of this is discussed by A. M. Fishberg¹³. Addison,¹⁴ as Fishberg remarked, does not appear to have noted the yellow colour of the skin, which is described as 'blanched, smooth, and waxy' in his classical account. Biermer¹⁵ was probably the first to describe the characteristic yellowish tint of the skin, due to a yellowish discoloration of the blood serum. Naegeli¹⁶ observed an increase of serum pigment in every one of 20 cases. Van den Bergh¹⁷ showed that the deeper pigmentation is largely due to an increase in the bilirubin content of the serum. The serum is golden or golden-brown instead of the normal straw-yellow tint. Schumm¹⁸ demonstrated spectroscopically the very frequent presence of hæmatin in the serum of patients with pernicious anæmia, and which, as Fishberg states, is also concerned in the characteristic discoloration. Fishberg believes that observation of the serum colour is of particular value in the differential diagnosis between pernicious anæmia and secondary anæmia due to carcinoma—the *cancer à forme anémique* of the French. If the serum pigmentation be increased, it points to the anæmia as being pernicious. This is not absolute, for the increased colour of the serum may be due to hepatic metastases from an occult carcinoma, in which case the amount of urobilin in the fæces becomes very important as an index of blood destruction, but may be differentiated by the fact that the serum gives a prompt van den Bergh reaction, whilst in pernicious anæmia the reaction is delayed. Again, the

increased pigmentation may not be due to bilirubin, but to the presence of lipochrome, common in diabetics as a result of diet, and in various conditions, including carcinoma, all of which states can be distinguished from the pigmentation due to bilirubin by the use of the van den Bergh test. Fishberg found the bilirubin content of the blood serum to be above normal (expressed in van den Bergh's units) in 13 of the 17 cases which formed the basis of the report.

A. T. Todd¹⁹ lays emphasis on the vital importance of *early diagnosis*, when response to treatment is best obtained. The variation in ordinary symptomatology is described. Reference is made to wasting as being common in the later stages, but may be masked by slight anasarca. Loss of flesh may be early, and generally as a result of gastro-intestinal disturbance at a time when the anæmia perhaps is barely noticeable. Unless these facts are borne in mind, the disease may be unrecognized and much valuable time lost. A complete blood examination and a gastric analysis are a desideratum, whether anæmia be obvious or not, whenever there is definite ill-health of more than brief duration. Todd concludes: (1) Addison's anæmia is a common disease, and through most of its course is not an anæmia; (2) Diagnosis is possible in the pre-anæmic stage; (3) In the early stages treatment is highly successful, but must be perpetual; (4) In the later stages exhaustion of the marrow, or aplasticity, supervenes, when treatment is without result; (5) Hereditary transmission of the anæmia, and of relative or complete achlorhydria, is so frequent that the relations of any case should be examined for these defects.

TREATMENT.

The principles of the new treatment by **Liver Diet** are stated below in a special article. Here it is necessary only to give some practical details.

The following is a copy of the diet used by Minot and Murphy:—

1. Liver (calves, beef, chicken) or kidneys (lamb) freshly cooked—at least 4 oz., preferably 7 or more oz. (cooked weight). Cook without fat—broil, bake, boil, mince, or make into soup.

2. Fruits, preferably fresh—especially peaches, apricots, pine-apple, strawberries, oranges, grape-fruit—about 14 oz. Raisins desirable: allow them to be eaten freely.

3. Red muscle meat, trimmed free from fat—freshly cooked, 4 oz. or more. Beef heart is desirable.

4. Vegetables containing 1 to 10 per cent of carbohydrate—preferably freshly cooked or raw—not less than 10 oz. Lettuce, spinach, asparagus, cabbage, and tomato are especially desirable.

5. Fats restricted—not over 2½ oz. Avoid cheese, bacon, fried food. Allow but little cream and butter, and not over one egg. Use mineral oil for salad dressing.

6. Avoid grossly sweet foods. Allow sugar sparingly.

7. Starchy food as cereals, potato, bread—add to suit the individual, but not to the exclusion of the requirements given above. The starchy foods ought to be crusty or dextrinated. Whole wheat toast is desirable.

8. Milk best limited to 9 oz.

9. Avoid excess of salt. Tea and coffee as desired.

Useful recipes for serving the liver diet have been compiled in booklet form by Florence Irvin.²⁰ Manumalian liver is recommended, but chicken's liver or lamb's kidney may be substituted for a change. Rabbits' livers should be easily procured from the poulterer, and prove milder in flavour than either sheep's, pig's, or ox's liver. Pig's liver is mild in flavour, and preferred by some, but ox's and sheep's livers are easily obtained in most districts. Only

very fresh liver can be used, and it should not be soaked in lukewarm water and salt, or parboiled, as recommended in most cookery books. Simplicity in preparation, and the less cooking the liver receives, the better. Sufficient for one meal only should be cooked at a time. There is no need for monotony in serving the liver, as the dietary gives a good choice of vegetables to produce variety.

The following recipes are taken from Miss Irwin's list :—

Raw Liver Juice.

Raw liver juice is recommended for the acute stages of the disease, and is prepared as follows :—

8 oz. fresh liver	Water, or orange- or lemon-juice, according to the doctor's orders
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Method.—8 oz. liver produces about 6 oz. pulp and juice. Use only very fresh liver. Pass it twice through the mincer, catching every drop of juice. Then rub through a wire sieve, scraping the under part of the sieve well. Put the pulp so obtained into a vessel, and if possible set it on ice for an hour or two to chill it thoroughly. *To Serve:* According to the quantity ordered, serve it in a ruby glass with chilled orange- or lemon-juice added, or merely a little cold water.

Note.—In this form it is given in the worst stages of the disease, a little at a time and often.

The following formulæ may also be useful :—

Raw Liver Sandwiches.

Brown bread and butter	Mustard, pepper, salt
Lettuce or tomato or mustard and cress	6 oz. liver <i>purée</i> ($\frac{1}{2}$ lb. liver)

Method.—Pass the liver twice through the mincer, and rub through a wire sieve. Weigh after sieving. Season it lightly with made mustard, pepper and salt. Cut some thin brown bread and butter, spread it thickly with the liver, sprinkle some tomato, lettuce, or cress, with a drop or two of vinegar, cover the liver with this, and place a piece of bread and butter on top to form the sandwich. Press, and cut neatly. Serve as directed by the doctor.

Note.—The bread may first be spread with anchovy paste or 'Gentlemen's Relish'.

Curried Liver.

8 oz. liver	2 teacupful stock
1 teaspoonful curry powder	Slice of apple, or $\frac{1}{2}$ stick rhubarb
1 teaspoonful flour	$\frac{1}{2}$ teaspoonful lemon-juice
1 teaspoonful good chutney	Salt

Method.—Start by making the sauce. No fat being allowed in this diet, the methods differ somewhat from ordinary cookery-book methods for curry sauce. Peel, scald, and chop the onion. Chop the apple or rhubarb. Blend the flour and curry powder in a little of the stock. Put the rest of the stock on to boil, add the onion, apple, rhubarb, and the chutney, and cook till the onion is tender. Stir in the flour, etc., and simmer two minutes longer. Meanwhile cut the liver in small pieces as for any other curry. Add to the curry sauce, and simmer for 15 minutes, or till the liver is tender. Add the lemon-juice, and serve with a little plain boiled rice.

Liver and Vegetables in Casserole.

8 oz. liver	Pinch powdered herbs
1 teacupful stock	Pepper and salt
1 onion	1 tablespoonful mushroom ketchup
1 heaped teaspoonful chopped parsley	2 tomatoes

Method.—Peel, scald, and slice the onion, slice the tomato, cut the liver in slices, chop the parsley. Place the vegetables in the casserole, sprinkling the parsley between. Add the stock. Place in a hot oven, and cook till the vegetables are nearly tender. Add the sliced liver, piling the vegetables on top of it. Put on the lid, return to the oven, and cook till the liver is tender—about 30 minutes longer.

Note.—It is well to cook the vegetables first, so that the liver may not be overcooked. The dish may be varied indefinitely by varying the vegetables. String beans cut in the usual way make a valuable addition. Where mushrooms are available they are always appreciated.

The booklet should be consulted for a complete list of various liver dishes.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1926, Aug., 476; ²*Amer. Jour. Med. Sci.* 1926, Aug., 173; ³*Guy's Hosp. Rep.* 1926, July, 287; ⁴*Ibid.* 294; ⁵*Jour. Amer. Med. Assoc.* 1926, Dec., 1957; ⁶*Arch. of Internal Med.* 1926, Sept., 292; ⁷*Brit. Med. Jour.* 1910, i, 1306; ⁸*Deut. Zeits. f. Nervenhe.* 1895, vi, 313; ⁹*Jour. Amer. Med. Assoc.* 1902, xxxviii, 148; ¹⁰*Amer. Jour. Med. Sci.* 1919, March, 400; ¹¹*Brit. Med. Jour.* 1926, ii, 185; ¹²*Jour. Amer. Med. Assoc.* 1918, i, 67; ¹³*Amer. Jour. Med. Sci.* 1926, July, 81; ¹⁴*Dr. Addison's Works*, New Sydenham Soc. Ed., London, 1868, 212; ¹⁵*Cor.-Blatt. f. Schweiz. Aerzte*, 1872, ii, 15; ¹⁶*Deut. Kong. f. inn. Med.* 1913, xxx, 303; ¹⁷*Der Gallenfarbstoff im Blute*, Leipzig, 1918; ¹⁸*Zeits. f. physiol. Chem.* 1916, xcvi, 32; ¹⁹*Brit. Med. Jour.* 1926, ii, 180; ²⁰*Recipes for Drs. Minot and Murphy's Liver Diet* (printed by the Northern Whig, Ltd., Bridge Street, Belfast, price 1s.)

PERNICIOUS ANÆMIA: LIVER TREATMENT.

F. R. Fraser, M.D., F.R.C.P.

In August, 1926, Minot and Murphy¹ reported that they had obtained good results by treating patients with pernicious anæmia by a well-balanced generous Diet, containing fresh fruit and vegetables, and rich in animal proteins and especially rich in liver. In this first paper they reported the results in 45 patients, and a year later in a second paper² they recorded their further observations on these patients and the results on 60 others. In their second paper, while still maintaining the value of the well-balanced diet, they showed it was the Liver in the diet that caused the striking effects.

Changes in the Blood.—In patients in the stage of relapse or before the first remission, the earliest effect of the administration of liver is a rise in the percentage of the reticulated red cells (reticulocytes) in the circulating blood. This response of the reticulocytes has been discussed by Murphy, Monroe, and Fitz.³ It appears in from three to six days after commencing liver in adequate doses, and the percentage reaches its maximum a few days later. The height of the rise in the reticulocytes depends upon the degree of anæmia, and is higher as a rule the lower the red-cell count prior to the treatment. When the red-cell count is about 1,000,000 per cubic millimetre the reticulocyte percentage should reach 15 per cent or even 40 per cent. After the maximum is reached, the reticulocytes decrease rapidly in number and return to the normal percentage (below 1 per cent) a few days later. With the commencement of the rise of the reticulocytes, the red cells begin to increase, and continue to do so steadily after the return of the percentage of reticulocytes to normal (Fig. 75). The rate of increase in the red cells in 108 patients whose counts before commencing treatment were below 2,700,000 per cubic millimetre is

shown in the following table taken from a communication by Minot and Murphy¹ at the meeting of the British Medical Association at Edinburgh in July, 1927.

Time of Observation	Average R.B.C. count per c.mm.
Before diet began	1,500,000
After diet taken about one month ..	3,360,000
" " " " two months ..	4,250,000
" " " " from four to six months ..	4,650,000

The hæmoglobin also rises steadily, but usually at a rate a little less than that of the rise in red cells, so that the colour index diminishes somewhat and

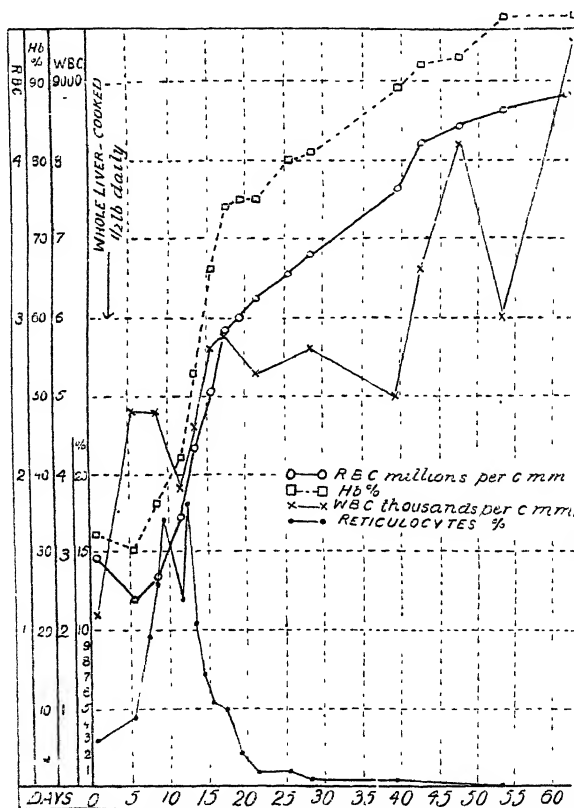


Fig. 75.—Illustrates the action of whole liver in a woman, age 47, in the second relapse of pernicious anemia. (Reproduced from the article by Brewer, Wells, and Fraser, *British Medical Journal*, 1928, i, 163.)

may become less than 1. The leucocytes increase, and especially the polymorphonuclear leucocytes, so that the total leucocyte count and also the proportion of the different varieties approach the normal. Occasionally, however,

the polymorphonuclear eosinophils increase disproportionately, and they may form 20 per cent of the total leucocytes. With the increase in the red cells the excess of pigments in the serum disappears, and when estimated by the 'icteric index' or the van den Bergh reaction they are found to be present in normal amount or even less than normal. The average size of the red cells also returns to normal, but a wider variation than normal in their size usually persists.⁵

Changes in the General Condition and Symptoms.—Accompanying the improvement in the blood picture there is a striking improvement in the general condition of the patients and in their symptoms. With the commencement of the increase in reticulocytes the weakness and depression rapidly decrease and the appetite returns. The symptoms that are due to the anæmia, such as headache, dyspnoea, palpitations, cardiac pain, and numbness of the extremities, disappear more gradually as the red-cell count and hæmoglobin percentage approach the normal. It is not to be expected that objective evidence of degenerative changes in the nervous system, such as absent tendon reflexes, should disappear as the result of treatment; but Minot and Murphy² report a surprising degree of improvement in the objective sensory disturbances. In some cases evidence of progressive degeneration has appeared during treatment,⁶ but Minot and Murphy consider that no definite progression in neural lesions was observed in their cases when large amounts of liver were taken. Subjective sensory disturbances certainly diminish, and the return of absent tendon reflexes has been reported.⁷ At present there is no decisive evidence as to the effect of the treatment on the lesions of the nervous system. Mental disturbances are sometimes markedly affected, loss of memory, unreasonable behaviour, and irritability disappearing rapidly, so that the patient's temperament seems to be entirely altered. The achlorhydria that is always present is not affected.

In view of the natural remissions that occur in pernicious anæmia, doubt may be felt that the immediate effects recorded above are not necessarily the result of the treatment; but the remarkable uniformity in the response in over 150 cases, and the striking regularity of the appearance of the reticulocytes within a few days of the commencement of the treatment, followed by the gradual increase in the red cells and hæmoglobin, are sufficient to remove any possibility of the results being due to naturally occurring remissions.

Progress under Continued Treatment.—These immediate effects of liver treatment have been confirmed by observers in other countries,^{8, 9, 10} and in this country Anderson and Spriggs,¹¹ Spence,¹² Phillipps,¹³ and Brewer, Wells, and Fraser⁶ have reported similar results. In a disease which is characterized by remissions and relapses, a considerable time must elapse before the value of treatment can be accurately estimated, but in their published reports Minot and Murphy record that none of their patients who have continued to take adequate amounts of liver have relapsed, and that some of their patients have been under treatment for over three years. A slight fall in the red-cell count occurs if adequate amounts are not taken, or in the event of an infectious process developing. Increasing the amount of liver, or treatment of the infectious process, has resulted in a rise again in the red-cell count.

A few cases have been met with that responded very slowly to liver treatment in spite of taking adequate amounts. In the experience of Minot and Murphy² these cases have had complicating infections, or cirrhosis of the liver, or they have been treated previously by blood transfusion on a large number of occasions (e.g., twenty-five and thirty-five). They suggest that these factors may prove to be responsible for the slow response.

Many patients have commenced treatment in the stage of remission, and in

them it is not possible to demonstrate the striking improvement seen in those who commenced in the stage of relapse or before the first remission, but these patients have benefited materially, and so far there have been no records of relapses while continuing with adequate liver treatment.

Pernicious anæmia is not always easy to diagnose, and difficulty has been experienced especially in cases of aleukæmic myelosis and of sprue. Mistaken diagnoses may account for the two cases reported by Brewer, Wells, and Fraser in which the treatment failed, and it is probable that Minot and Murphy are justified in believing that "essentially all patients with pernicious anæmia can

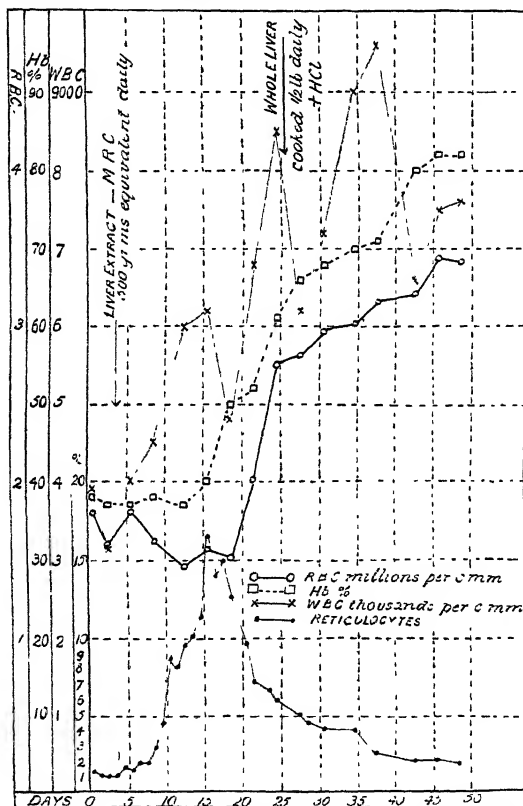


Fig. 76.—Illustrates the action of liver extract in a woman, age 34, in the first relapse. (Brewer, Wells, and Fraser, *British Medical Journal*, 1928, i, 165.)

be benefited, and usually markedly and promptly". Although it is not yet time to pass judgement on the ultimate results of liver treatment in preventing relapses and in maintaining the improvement, the reports are most encouraging.

Liver Extract.—In the paper read at the meeting of the British Medical Association in July, 1927, Minot and Murphy⁴ were able to announce that E. J. Cohn had obtained a non-protein practically iron-free extract of liver that had the same effect as whole liver in patients in the relapse stage of pernicious anæmia, causing the temporary rise in the reticulated red cells

followed by the rise in the total red cells and in hæmoglobin.¹⁴ In July, 1927, Cohn and his collaborators¹⁵ published the method of preparing this extract. A considerable number of patients have now been treated with extracts prepared according to Cohn's method under the auspices of the Pernicious Anæmia Committee of the Harvard Medical School, and a preparation recognized as active by this Committee has been put on the market by Eli Lilly & Co. In Great Britain the Medical Research Council has undertaken to test extracts prepared by several of the large manufacturing chemists, and it is hoped that efficient extracts will be available very shortly in this country also. Some of these extracts are prepared by modifications of Cohn's process. In the preparation of the extract a considerable proportion of active substance is lost, since it is necessary to administer the extract in quantities that are equivalent to twice the adequate amount of whole liver, which is usually about half a pound daily. *Fig. 76* illustrates the effect obtained by an extract prepared in the laboratories of the Medical Research Council by a modification of Cohn's process, and shows an effect similar to that obtained with whole liver as illustrated in *Fig. 75*.

Mode of Action.—The reasons that led Minot and Murphy to treat cases of pernicious anæmia with a diet rich in liver were several in number. Perhaps the most important reason for considering that dietetic treatment might be of value was the similarity of pernicious anæmia in many of its symptoms to beri-beri, sprue, and pellagra, which are recognized to be due to, or associated with, faulty diet. The improvement in cases of sprue when treated with liver soup was one reason for emphasizing the importance of liver in the dietetic treatment, and the work of Whipple and his associates¹⁶ was regarded as evidence pointing in the same direction. They found that if a severe secondary anæmia was produced in dogs and maintained for a considerable period of time by repeated bleedings, a comparison could be made of the efficacy of different substances in causing a regeneration of hæmoglobin. Liver was found to be more efficacious than the other organic or inorganic substances tested.¹⁷ It is interesting to note that although this work of Whipple suggested to some extent, at any rate, the treatment of cases of pernicious anæmia by liver, there is little evidence for believing that the hæmoglobin-forming mechanism is at fault in pernicious anæmia, in which the main abnormality is probably a difficulty in the formation of the corpuscles.

The studies of Peabody¹⁸ on the bone-marrow in pernicious anæmia have thrown light on the mode of action of the liver treatment. In the stage of relapse the bone-marrow is packed with megaloblasts, but in the stage of remission brought about by liver administration the megaloblasts decrease in number and appear to proceed to develop into mature megalocytes, and the bone-marrow gradually returns to its usual normoblastic condition. The reticulated red cells that appear in large numbers within a few days of commencement of liver treatment are young cells,¹⁹ and are mainly larger than the normal erythrocyte; thus it appears probable that liver treatment acts by stimulating the megaloblasts of the bone-marrow to proceed to maturity, so that young megalocytes appear in the circulation in large numbers. The return of the bone-marrow towards the usual healthy normoblastic state occurs later. It is possible that the administration of liver, or of the extract, supplies some substance that is necessary to the maturation of the red cell and which is missing or not available in pernicious anæmia. Administration of liver is without effect in secondary anæmias, and there is no evidence that it has any direct effect in checking hæmolytic.

The achlorhydria that is always present in pernicious anæmia, and that has been shown to be present for considerable periods before the development of

pernicious anæmia,²⁰ and that is found in patients who do not develop pernicious anæmia, is not affected by liver treatment. This fact suggests that liver treatment has a powerful action in patients with pernicious anæmia in correcting the anæmia by stimulating the red cells to develop normally, but that it has no action on the underlying abnormality which is present in patients who develop pernicious anæmia and of which achlorhydria is the demonstrable evidence. That a non-protein practically iron-free extract of liver has this action, points to a therapeutic principle of great value, of which we have had hitherto no knowledge and no suggestion. Further work is necessary before the substance present in the extract that is responsible for this action is isolated or defined.

Administration of Liver.—Mammalian liver appears to be more effective than that of fowls, and that obtained from oxen, calves, sheep, or pigs may be used. The liver may be cooked in any way that pleases the patient, but prolonged boiling is to be avoided.² Although raw liver is probably rather more efficacious than cooked liver, half a pound of cooked liver daily is usually sufficient to bring about a prompt response. A smaller amount is often quite sufficient, but the response may be developed less promptly. Raw liver pulp mixed with orange-juice is easily taken, and some patients prefer this method of administration, as it leaves them more free to vary the ordinary meals of the day. For very ill patients the juice of half a pound of raw liver has been found to be a convenient method of administration in the period before the appetite recovers, but must be administered in large amounts to produce the maximum benefit. Liver soup is also useful in certain cases, and makes an agreeable change for patients who are taking large amounts of whole liver. Although half a pound of cooked liver daily is the usual dose necessary to produce the maximum benefit in the early stages of treatment, there is evidence that, when the condition of the patient and of the blood approaches the normal, smaller amounts suffice to maintain the improvement and to prevent relapses. It is probable that some patients require more and some less to maintain their improved condition, but many appear to remain well on half a pound three days in the week, or less. Cases have been reported in which acute exacerbations of gout have appeared during liver treatment, though it is not clear that these attacks were due to that treatment. It is not certain that excessive production of red cells can result, but it is always advisable to regulate the amount of liver by the condition of the patient and of the blood. Minot and Murphy state that kidneys can be substituted for liver, and that kidney administration results in a similar increase in the reticulocytes and in the number of red cells. (For suitable recipes, see p. 331.)

The extract that is prepared on the commercial scale is a relatively crude product. It is a powder that is deliquescent and must be kept securely corked. It is readily soluble in water and can be conveniently administered with orange- or lemon-juice. This extract is labelled in terms of its equivalent in whole liver, but should be given in amounts equivalent to twice the effective quantity of whole liver. Thus, the usual dose at the commencement of treatment should be the equivalent of 400 to 600 grm. of liver in order to get the same result as that obtained by half a pound of whole liver.

Additional Methods of Treatment.—The fact that the achlorhydria is not affected by liver treatment points to the necessity of paying the same attention to the general condition of the patient as formerly. Septic conditions and infections must be treated, and **Hydrochloric Acid** administered, and all faults in general hygiene corrected. Even if liver treatment appears to have an almost specific action on the anæmia, it is advisable on general grounds to continue the generous well-balanced diet that Minot and Murphy originally recommended, a diet especially rich in fresh red meat and in fresh fruits and

vegetables. This is especially important when the extract is being used to obtain the liver effect. In very ill patients who have difficulty in taking adequate amounts of liver and who are becoming rapidly worse, a preliminary **Blood Transfusion** may be a life-saving measure.

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PHARMACOLOGY AND GENERAL THERAPEUTICS. *Ivor J. Davies, M.D.*

Technique of Medication by Injection.—Professor B. Fantus,¹ of Chicago, continues a series of practical articles on the technique of medication which when completed will be assembled in book form. *Needle administration* in general is described at some length which is perhaps warranted. Injection of medicaments is now universal, and attention to detail is absolutely necessary. The hypodermic case should be frequently inspected, the parts, especially the needles, renewed when necessary. Strict asepsis, the assembling of the parts of the syringe by means of a forceps and not by the fingers, are most essential to success. Patients who have frequent hypodermic injections soon learn to appreciate the difference between a sharp and a blunt needle. A needle should be discarded or resharpened as soon as it is the least bit dull. If one is in doubt as to the integrity of the needle, a forcible attempt should be made to bend the shaft on the hub. The most unpleasant complication of intramuscular injection is the breaking of a needle while in the tissue. To avoid this occurrence, only the finest type of steel and tempered gold needles should be used for intramuscular work. If a needle breaks it is best not to discuss the situation with patient or nurse, but to keep the left hand in position until an attempt has been made to recover the needle. The usual point of fracture is at the junction of the hub and shaft, and with an assistant the fragment just beneath the skin may sometimes be recovered by a small incision. If this is not done, when the left hand is released from the part, e.g., the buttock, the needle is lost, and can afterwards be only located by X rays, and removed through an extensive surgical procedure. The reviewer once saw a needle break whilst the chest was being explored for pleural effusion. The precautions just described were not observed, and, without previous location of the missing part, an immediate extensive incision and prolonged search undoubtedly contributed to the subsequent fatal termination.

Intramuscular injection,² as Fantus remarks, has the advantage of more rapid absorption and less liability to abscess formation or necrosis from the introduction of irritant material. It has the disadvantage of greater liability to an accidental intravenous injection which might give rise to an alarming or even dangerous intensity of action. This can be avoided by proper technique, and it is necessary to aspirate for at least ten seconds before injection to make sure that the point of the needle is not in a vein. If blood is aspirated,

the needle should be withdrawn and reinserted a short distance from the place of the first puncture.

In a description of the indications for intravenous therapy, Fantus emphasizes the value of sugar solution in preference to salt solution. Dextrose supplies a definite amount of nourishment. Two litres ($3\frac{1}{2}$ pints) of isotonic dextrose solution (approximately 4.5 per cent) represents about 260 calories. Amongst other conditions, Dextrose infusions are valuable in post-operative acidosis, with persistent nausea and vomiting; also in the hyperemesis of pregnancy as well as in other forms of hyperemesis. In discussing the limitations of intravenous therapy,³ Fantus says that anaphylaxis must be kept in mind, especially in the treatment of allergic persons. Hence, in asthmatic and other allergic patients, intravenous injection should, if possible, be avoided.

Intracardiac injection,⁴ discovered about fifty years ago by Schiff, a German physiologist, constitutes the most powerful and prompt form of heart stimulation known. The chief drug employed for intracardiac injection is *Epinephrin*; the effect on the heart is wonderful. A dose of 1 c.c. is generally considered a maximum, though as much as 5 c.c. has been employed. Solution of *Pituitary*, though feebler in action, is possibly safer in cases of arteriosclerosis, myocardial degeneration, the heart of hypersensitive thyrotoxic patients, and in nephroses. The technique of intracardiac injection is also described by Fantus.

*Intraperitoneal injection*⁵ is preferable in children to the intravenous route, and of late has become a method of great practical importance, and especially in conditions of dehydration and acidosis through persistent vomiting. Many report striking results not only from Salt solution but also from 6 per cent Dextrose solution, and from 2 to 3 per cent Sodium Bicarbonate.

Fantus refers to the so-called *puncture headache of subarachnoid injection*,⁵ which may be accompanied by nausea, vomiting, faintness, and mental confusion. The symptoms are brought on and aggravated by exercise and relieved by recumbency. The flatter the patient lies, the better he feels. It is due to a disturbance in the pressure relations in the cerebrospinal fluid, most commonly from leakage through the puncture hole to such an extent that the brain is left without its water cushion. It is most liable to occur when normal pressure existed within the canal before the puncture and when a large needle is employed. On the other hand, when the pressure is high, puncture often relieves headache as well as other symptoms. It should therefore be a fundamental principle to retain or restore as nearly as possible normal pressure conditions in the sac. If the pressure is normal (from 40 to 130 mm. of water on lumbar puncture—Quincke) as much fluid should be withdrawn as one intends to inject. If the pressure is abnormal—as measured while the patient is resting and breathing quietly, for straining may raise the pressure considerably—fluid is permitted to escape slowly under repeated control of its height until it is approximately normal, never below normal. If the pressure is very high, above 300, it is best not to reduce it below, say, 150 at the first puncture. The flow should be checked instantly if any distress appears, such as headache, dizziness, nausea, or vomiting, or if there is a sudden marked lowering of pressure. The latter change, which might result even in sudden death, may occur when the communication between the spinal and cranial subarachnoid spaces is suddenly occluded, as may happen during lumbar puncture in case of tumour of the posterior fossa. Hence, even suspicion of the presence of such a condition contra-indicates such puncture. To reach the brain the point of election for introduction of serum is the cisterna magna. Indeed, in all diffuse conditions, cisternal injections should be the method of choice, and it is particularly indicated when it is necessary to reach the upper reservoirs of the cerebrospinal fluid system in cases of subarachnoid block.

A von Sarbó,⁶ quoted by Fantus, considers cisternal puncture preferable to lumbar puncture even for diagnostic purposes, because he finds it easier for the operator, less disagreeable to the patient during its performance, and practically free from undesirable after-effects. Although he considers this method to be simple in execution, he warns anyone from performing it on the living until he has practised it on the cadaver.

The Status of Intravenous Therapy.—The Therapeutic Research Committee of the Council on Pharmacy and Chemistry, U.S.A., appointed a special committee to report on the status of intravenous therapy. The committee consisted of Cary Eggleston (Chairman), R. Hant, W. S. McCann, and C. Voegtlin. The introductory report⁷ presents a general review of the more or less established indications and contra-indications for intravenous therapy. They emphasize the fact that the injection of any foreign substance directly into the human blood-stream is always a serious undertaking. There are many conditions in which the risks inherent to intravenous therapy may greatly outweigh the real or supposed advantages which are claimed for the procedure. This is particularly likely to be the case with the more or less potent drugs. When intravenous therapy is really indicated it should not be left as a last resort, but the patient should be given the benefit of its prompt employment. In diabetic coma the intravenous administration of **Insulin**, with or without the simultaneous infusion of **Glucose**, may prevent untimely death. Acute circulatory collapse sometimes responds to the slow injection of weak solutions of **Epinephrin** in physiological sodium chloride solution.

Occasionally the intravenous administration of **Ouabain** or of amorphous **Strophanthin** will restore patients with cardiac failure when almost moribund. However, few cases of heart failure are so urgent that they cannot be brought under control sufficiently rapidly by the intramuscular injection of ouabain, strophanthin, or the oral administration of appropriate doses of digitalis. When ouabain or strophanthin is injected intramuscularly, the site of the injection should be massaged vigorously for about ten minutes. This minimizes the local pain which might otherwise result, and hastens its absorption. The usual dose is from 0.25 to 0.5 mgrm. The difference in the rapidity with which the therapeutic action of most agents can be secured by the several modes of administration is only occasionally of sufficient importance to warrant resort to the more difficult practice of intravenous administration, the promiscuous use of which may be dangerous. The risks of intravenous injection frequently outweigh its probable benefits in: (1) Greatly weakened patients; (2) The aged; (3) At times, patients with hypertension, arteriosclerosis, or heart disease; (4) Patients known to be, or suspected of being, hypersensitive to one or more proteins, such as patients with asthma, hay fever, or urticaria; and (5) Patients known to have drug idiosyncrasy.

In technique, asepsis should be as rigorous as that for any other surgical operation. Attention is drawn to the fact that distilled water used for solutions frequently contains a pyrogenic substance as a result of contamination with living organisms carried over in the process of distillation. This may be obviated by employing water that has been properly distilled within a very few hours of its use.

The intravenous injection of **Glucose Solution** has recently been gaining favour among obstetricians for the treatment of excessive vomiting of pregnancy and following venesection in the treatment of eclamptic convulsions. Its use is recommended only after milder measures have failed. From 500 to 1000 c.c. of a 10 or even 20 per cent solution may be given. When the stronger solution is employed, some obstetricians advocate simultaneous administration of small doses of **Insulin**. In severe cases of diabetes the

occasional administration of over-doses of insulin may result in shock in which the patient may lose consciousness and become unable to swallow. Under such circumstances the hypoglycæmia may be combated expeditiously by the intravenous injection of 10 to 20 grm. of glucose (100 c.c. of 10 or 20 per cent solution).

Mercurochrome.—H. H. Davis⁹ discusses the present status of mercurochrome-220 soluble. The dye (the sodium salt of dibrom-oxy-mercury fluorescein, which contains 26 per cent of mercury) has been previously described in the *MEDICAL ANNUAL*, 1926, p. 358, and 1927, p. 356, etc.). The contribution includes a full review of the literature and a summary of personal experimental work. Davis draws the following conclusions: There is experimental evidence of the value of mercurochrome-220 soluble intravenously in the treatment of septicæmia and other infections. Other equally convincing experimental results point to the fact that it is not bactericidal in blood, and that its use is not unattended by danger. Many clinical reports show miraculous cures, others have no benefit, and in some it has probably hastened death. Therefore, treatment with mercurochrome must still be considered in the experimental stage. Because of its dangers it should not be used indiscriminately and should be reserved for desperate cases. Mercurochrome is dangerous intraperitoneally because of the local irritant action and of the often very severe general reaction. If used in wounds, sinuses, or serous cavities its dose should be limited to 5 mgrm. per kilogramme of body weight, as it is easily absorbed, and if too much is used it may lead to severe reaction or stomatitis. The alcohol-acetone-aqueous solution of mercurochrome recommended by W. W. Scott and J. H. Hill⁹ is a very satisfactory pre-operative skin antiseptic. However, it should not be injected into the nose, urinary bladder, vagina, and so forth, along with a local anæsthetic, as this will give a precipitate.

Novasurol.—P. Saxl¹⁰ makes a further contribution on novasurol therapy. The drug, a double salt containing 33.9 per cent of mercury, has already been described (*see MEDICAL ANNUAL* 1927, p. 356, and 1925, p. 209). Favourable results of its diuretic action were reported, especially in cardiorenal sclerosis with œdema, and in portal cirrhosis. Saxl refers to the use of novasurol as a valuable supplement to existing remedies, especially digitalis, and now recommends the administration of the drug by the mouth, as well as by injection. He describes cases of mitral disease with decompensation and œdema, where, by the combined use of the drug by the mouth and injection, life was undoubtedly maintained and preserved for many years. It had previously been found that any interruption of treatment of novasurol by injection brought the patients into a serious state, but this was now rendered possible by the alternative mode of peroral administration. The drug was given in doses of 0.2 grm. enclosed in a hard gelatin capsule, once daily, and generally after breakfast, or, when well tolerated, before this meal. Administration can be continued for weeks as long as is required, or for months with brief intermissions. Ill-effects were very rarely observed. Contra-indications are renal disease, hypertension, anæmia, cachexia, fever, diarrhœa. The further perfection of treatment by novasurol is likely to result from its practical application.

Cardiazol.—H. Biedermann,¹¹ Jena, records a further clinical experience with the new water-soluble camphor preparation 'cardiazol' (Knoll) for subcutaneous and intravenous injection. This new anæleptic remedy is a pentamethylenetetrazol and has a therapeutic action very similar to camphor, but is much superior to it as a restorative in all cases of severe circulatory disturbances. It is, moreover, soluble in water and without taste or odour. It is given in 1 c.c. doses subcutaneously, and hourly when necessary for twelve

to twenty hours. A marked therapeutic effect is obtained from one to three minutes after injection, and lasts for from half to one and a half hours. The drug is a most valuable post-operative remedy, and especially in collapsed states from circulatory depression. It is also useful in general infections and in severe states of intoxication as, e.g., carbon monoxide poisoning, and in poisoning by meat. Respiration is also restored, and here cardiazol has an action very similar to 'lobelin' (Ingelheim). Oral administration in tablet form is recommended where prolonged effects are desired over days or weeks, as in pneumonia or septic diseases. Ill-effects were very rarely seen, and when necessary the drug can be given in a suppository.

A. Nawratil,¹² Neu-Titschein, records his results with cardiazol in various forms of disturbances of the circulation over a period of three months in hospital practice. The results in heart failure due to muscular insufficiency of valvular diseases were unsatisfactory. In cases of collapse following a sudden cessation of the circulation, and where the patient was pulseless and cyanosed and apparently in a hopeless state, the results of intravenous or subcutaneous injection of cardiazol were both surprising and striking. The drug was also efficacious in cases of severe pneumonia and in peritonitis, where the heart's action was well maintained by the injection of 0.1 per cent solution every one or two hours. No important differences were observed between the subcutaneous and intravenous modes of administration, but a much smaller effect was obtained in its use by the mouth or rectum. No important after-effects were noted.

Expuralgin.—E. W. Lipschutz,¹³ Brooklyn, reports the results of experiments to determine the pharmacological activity and therapeutic value of a new drug, expuralgin (potassium magnesium acetyl citrate), described as a non-toxic analgesic and antirheumatic drug of definite value in vascular hypertension. An artificial leucocytosis was probably responsible for the therapeutic potency of the drug in relieving local inflammatory conditions, mainly cases of the fibrositic group. The effects on diuresis and uric acid elimination were similar to those observed by Kahn and Cohn with the allylphenylcinchonin ester (atoquinol). Hypertension when not due to arteriosclerosis was relieved. The average dose was 10 gr. (0.65 grm.), at variable intervals according to the nature and severity of the condition.

Pituitary Gland.—H. Gardiner Hill and J. F. Smuth¹¹ submit a preliminary report on the effects of feeding anterior lobe pituitary extracts to children. The cases which were investigated fell into three groups: (1) Children with infantilism and defective growth; (2) Older female children with minor degrees of this condition and disturbances of menstruation; and (3) Children with obesity of the apparently endogenous type. Desiccated anterior lobe extract (Armour) was used in gradually increasing doses up to 15 gr. a day by the mouth. They conclude: "(1) Feeding of anterior lobe pituitary extracts by mouth does appear to have some therapeutic value, although the number of cases which we are quoting is too small to allow of dogmatic statements. (2) In cases of infantilism, where the epiphyses are not already fused, these extracts appear of value in influencing growth. (3) They may prove of value in certain types of amenorrhœa associated with minor degree of infantilism. (4) The effect of these extracts on the blood-sugar curve has been constant in all the cases which we have investigated, but in the present state of our knowledge we cannot attempt to give an explanation of this".

Ephedrine.—W. S. Middleton and K. K. Chen¹⁵ record, from their observations on 41 patients, that ephedrine when administered orally, in varying doses, causes an average rise of systolic blood-pressure of 28.5 mm. of mercury. The average duration of the rise was five hours. The pulse was accelerated. The

dose recommended for oral administration is 60 to 90 mgrm., or from 1 to 1½ gr. R. W. Rudolph und J. D. Graham,¹⁶ reporting on studies of ephedrine sulphate, also remark on the similarity of action between ephedrine and adrenalin, but the effects of the former were more lasting and were equally effective with oral administration of the drug. They have found it especially useful in combating the fall of blood pressure in spinal anæsthesia. The drug relieves asthma, and also raises the blood-sugar.

Parathyroid Therapy.—J. B. Collip¹⁷ regards the function of the parathyroid hormone to be that of regulator of calcium metabolism, and its action is primarily as a calcium mobilizer. Describing effects of over-dosage in animals, he says that "chief among these are a great increase in inorganic phosphorus in both whole blood and serum, and increase in urea and non-protein nitrogen, frequently a decrease in chlorides, and invariably a great increase in viscosity with which is associated a decrease in plasma volume. In the terminal stage there is a marked acidosis. For some hours prior to death from parathyroid hormone over-dosage there is almost complete anuria. A unit is defined as one-hundredth of the amount of extract which will produce an average increase of 5 mgrm. in the blood calcium of normal dogs of approximate 20 kilo. weight over a period of fifteen hours.

L. A. Hoag and Helen Rivkin¹⁸ treated four cases of infantile tetany with parathyroid extract, and recommend a dose of 5 units per kilo. for each mgrm. of calcium rise desired, to be given in a period of from twenty-four to thirty-six hours. McCann recommends in adults starting with doses of 10 units until serum calcium reaches a figure of 10 mgrm. Hypercalcæmia would be, in man as in animals, dangerous. Hjort and Eder,¹⁹ Detroit, record their observations in a case of adult tetany following thyroidectomy over a period of three and a half months. The only satisfactory treatment was parathyroid extract injection with the simultaneous administration of thyroid gland orally. Parathyroid extract given parenterally in large doses from 20 units to 130 units daily had little if any favourable influence on the condition. Satisfactory results were only obtained when thyroid gland was given in addition orally. H. Lissner, R. K. Smith, and H. C. Shepardson²⁰ describe an account of the successful treatment of a case of maternal tetany. Tetany followed immediately post partum, and the injection of the active extract alone at once relieved the tetanic spasms and raised the serum calcium from 7.5 to 9.7 mgrm. per cent.

Parathyroid therapy has been tried in many conditions—e.g., reports are already available on the effect of parathyroid extract in tuberculosis of the lungs. The only real indication for parathyroid at present is a low calcium content of the serum. It has been found successful in parathyroid tetany and infantile tetany. Its effect on gastric tetany has not been recorded, while maternal tetany has been definitely relieved by its usage. The hormone should not be given until the serum calcium figure has been definitely ascertained, and its dosage should be accurately controlled by repeated calcium determinations. A calcium value of 10 to 11 mgrm. is normal, and no further increase is desirable.

Venesection.—A discussion on venesection was opened by W. G. Spencer²¹ at the Royal Society of Medicine. It was agreed that venesection was not practised sufficiently to-day, and that many types of cases were likely to be markedly improved by its use. Dilatation of the right side of the heart was always an indication for its adoption. Hale-White remarks that the action of digitalis was enhanced by a preceding venesection. Status epilepticus and the convulsions of uræmia were also conditions suitable for blood-letting. Polycythæmia was always improved by a timely bleeding. Heat-stroke and asphyxia due to drowning and hanging were, in the opinion of Willcox, amenable to improvement by blood-letting. Fox emphasized the importance and

benefit received in cases of high blood-pressure, especially in the early types, in which he believed that increased tonus was the dominant factor, and not degenerative changes, in the cause of the increased blood-pressure. A periodic venesection, with starvation and rest in bed in cases of hyperpiesis, with a course of sulphates, was an excellent therapeutic combination.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1926, July, 169; ²*Ibid.* 321, ³*Ibid.* Aug., 409; ⁴*Ibid.* 564; ⁵*Ibid.* 667; ⁶*Klin. Woch.* 1926, May 7, 84; ⁷*Jour. Amer. Med. Assoc.* 1927, June, 1798; ⁸*Amer. Jour. Med. Sci.* 1926, Sept., 340; ⁹*Jour. of Urol.* 1925, xiv, 135; ¹⁰*Wien. klin. Woch.* 1926, July, 816; ¹¹*Munch. med. Woch.* 1926, Aug., 1323; ¹²*Zentralb. f. Chir.* 1926, Aug., 2072; ¹³*Med. Jour. and Record*, 1926, Sept., 276; ¹⁴*Lancet*, 1926, ii, 219; ¹⁵*Arch. of Internal Med.* 1927, March, 385; ¹⁶*Amer. Jour. Med. Sci.* 1927, March, 399; ¹⁷*Jour. Amer. Med. Assoc.* 1926, Feb., 565; ¹⁸*Ibid.* Mar., 1343; ¹⁹*Ibid.* 1927, May, 1475; ²⁰*Ibid.* Feb., 461; ²¹*Lancet*, 1927, i, 821.

PHARYNX, DISEASES OF.

A. J. M. Wright, M.B., F.R.C.S.

Carcinoma.—A critical discussion on the merits of the various alternative methods of treatment of carcinoma of the upper air- and food-passages was held at the annual meeting of the British Medical Association in 1926. F. J. Steward¹ pointed out that, in deciding for or against **Operation**, all factors should be taken into consideration. In only a small proportion of cases seen could the result of operation be regarded as hopeful, but in others it might hold out some chance of cure, or at any rate alleviation. The preparation for operation is important, but he is not in favour of making every patient edentulous. If this is done, time is wasted and the strain put upon the patient is considerable. Septic teeth, however, should be removed, and antiseptic mouth-washes employed. Intratracheal ether is the anæsthetic of choice. In a few cases the operation can be carried out through the mouth, if necessary splitting the cheek to give further room. In the majority of cases an operation of approach is necessary (see MEDICAL ANNUAL, 1927, p. 359). When the growth has been exposed, removal may be carried out either with the diathermy knife or the scalpel. Immediate suture of the pharyngeal wall should be carefully performed, and drainage of the external wound is essential. A soft feeding-tube through the wound in the neck into the pharynx avoids discomfort and the salivation produced by a tube through the mouth or nose. If the former tube be employed, both pharyngeal wall and skin should be fixed tightly round the tube.

Robert Knox has not found **Radiation** treatment of cancer in this region very satisfactory, the difficulty being to administer a satisfactory dose without running the risk of damage. Recently, with more powerful apparatus, results have improved. The best results are obtained with large quantities of **Radium** heavily filtered, and with high voltages of **X Rays** working at a greater tube distance than formerly. **X rays** are most valuable in combination with surgery to reduce glandular enlargement before operation and for radiation after operation. In inoperable cases, **X rays** give considerable alleviation. William Milligan confined his remarks on **Radium** to inoperable cases, as he does not consider that at present the results are sufficiently good to replace operation in favourable cases. He believes in small doses with long exposures. Sarcomata and endotheliomata are usually very sensitive to radiation, and in malignant disease of the nasopharynx radium is particularly useful. As with **X rays**, the chief function of radium is in addition to operation and not replacement.

Syme pointed out that the aim of surgical **Diathermy** is to coagulate the tissues, not to cauterize them. The correct current is therefore important. Where possible, it is advisable to remove the growth rather than simply to coagulate it and leave it to slough away. The technique he advises consists in plunging the diathermy knife into the tissues at intervals around the growth,

only turning on the current after the knife has been inserted. After a ring of coagulation has been produced around the tumour, it is removed with the diathermy knife. The main vessels supplying the growth are ligated previously, and glandular involvement can be dealt with while this is being done. Care should be taken not to do too much at one sitting.

Retropharyngeal Abscess.—Since the text-book descriptions of retropharyngeal abscess tend to give a false impression, a general review of acute retropharyngeal abscess in children, by Douglas Guthrie,² is worth considerable attention. Two varieties of abscess are recognized, the spinal and the lymphatic. The former is relatively rare, and when it exists it is associated with well-marked signs of tuberculosis of the cervical spine and is easily recognized. The acute or lymphatic variety is relatively frequent and much less easily diagnosed. Its origin is insidious. If unrecognized, it almost invariably ends fatally, but if treated recovery is the rule.

ANATOMICAL DATA.—The prevertebral fascia divides the neck into an anterior compartment containing the trachea and cesophagus, and a posterior compartment containing the vertebræ and muscles. Between the prevertebral fascia and the mucous membrane of the posterior pharyngeal wall on either side of the mid-line is a space, the space of Gillette, in which lies a group of lymphatic glands. These retropharyngeal glands are present in infancy but gradually atrophy as the child grows older. They are in direct communication with a group of glands behind the internal carotid artery.

PATHOLOGY.—The usual sequence is infection of the posterior carotid glands and a spread from these to the retropharyngeal group. Thus in two-thirds of the cases there is obvious enlargement of the cervical glands. The infection gains entry most commonly from the tonsil, but occasionally follows an operation for the removal of adenoids, and more rarely still there may be a direct spread of suppuration from the middle ear. The infective organism is most commonly the streptococcus; but tubercle, apart from spinal caries, is not infrequently found.

SYMPTOMS.—In the series of 20 cases, the condition was more frequent in boys than in girls, and the majority of the cases were under 1 year of age. The most characteristic and constant symptom is difficulty in breathing, leading frequently to a mistaken diagnosis of bronchitis or laryngeal diphtheria. Difficulty in swallowing is less common, being present in only 3 out of the 20 cases. A croupy cough and throaty cry may be present, and the head is held stiffly. Fever is slight or absent. The importance of a careful examination of the posterior pharyngeal wall, in a good light, is fundamental. Inspection will disclose a swelling on one side of the middle line. Palpation should only be carried out as an immediate preliminary to operation. If left untreated, death occurs from suffocation or rupture of the abscess. Rarely recovery takes place after spontaneous rupture.

TREATMENT.—The abscess should be incised as soon as the diagnosis is established, and it is now generally agreed that, in the case of acute abscess, such as is here described, the incision should be made through the mouth. In the rare cases of a chronic abscess associated with spinal caries, an external incision through the neck should be employed. It is of the utmost importance that no anæsthetic should be used, as, if it is, a fatal termination is not uncommon. The child should be laid on one side with the arms fixed by a blanket. A gag is inserted, and the abscess opened with a pair of long sinus forceps. The operation should be performed rapidly, and the child immediately turned over on its face. Convalescence is rapid. Of the 3 fatal cases in the series of 20, one died on the way to the hospital, the second immediately after admission, and the third just after the abscess had been opened.

Vincent's Angina.—It has long been recognized that infections associated with the bacillus and spirochæte of Vincent are met with most frequently among individuals who are living in insanitary conditions. Thus they were not infrequent among troops during the War. M. A. Reasoner and William D. Gill,³ as a result of this observation, have investigated the effect of soap solution on cases of Vincent's angina affecting the tonsils of American soldiers in Germany. They found, as has been observed before, that Vincent's spirochæte is not an uncommon inhabitant of the apparently normal mouth, and this fact is a potential source of danger. They note that a solution of ordinary **Toilet Soaps** has a selective action on this class of organism, and that the use of dentifrice containing soap thus tends to afford some measure of protection. They did not find, however, that soap was as effective as some other agents, particularly **Permanganate** or **Chromic Acid**, in producing cure of the lesions of Vincent's angina, but they do consider that soap has a valuable prophylactic use.

A general review of the lesions of the mouth due to Vincent's organisms is given by Joseph Colt Bloodgood.⁴ During the War, trench mouth was a common disease among the American soldiers and was found to be controlled by sodium perborate. Since the War, Vincent's angina has become a more common disease. This increase is probably partly an apparent one, in that individuals more readily present themselves for treatment. The lesions produced are very variable, and may consist of a diffuse involvement of the mouth or pharynx, or of a single spot. A characteristic patch consists of a red area of irregular outline with a central greyish necrosed patch. The slough spreads later, leaving an ulcer. Usually the lesions consist of a multiplicity of small ulcers, but a single one of nearly 2 cm. diameter may occur. Extensive lesions can be diagnosed from diphtheria by the absence of toxic symptoms. Vincent's angina is never met with in the edentulous mouth. Organisms can rarely be found in a mouth in which teeth and gums are healthy. As has been said, treatment with **Sodium Perborate** is a specific. It should be applied as follows: A thick paste of the salt is made up with water and spread by the fingers over all the teeth, and over any lesions. After five minutes, the mouth should be washed out with water. In severe cases, in addition to this, a gargle with a thinner solution should be used two or three times a day.

REFERENCES.—³*Brit. Med. Jour.* 1926, ii, 819; ²*Ibid.* 1174; ⁴*Jour. Amer. Med. Assoc.* 1927, March 5, 716; ⁴*Ibid.* April 9, 1142.

PHOTOTHERAPY.

Sir Henry Gauvain, M.A., M.D., M.Chir., F.R.C.S.
R. G. Bannerman, M.A., M.D.

This article is to be regarded as supplementary to our contribution to the **MEDICAL ANNUAL**, 1927, p. 361. Certain facts are reiterated and the more important advances in phototherapy reviewed. The subject of actinotherapy has been enriched by many contributions, of which some are of first-class importance and have added to our understanding of the manner in which light acts on the normal and on the abnormal organism. But there remain many gaps, and in particular there is much obscurity as to the manner in which light acts in a multiplicity of conditions not hitherto treated to any great extent by actinotherapy. There is much need of accurate clinical control observations, for there is otherwise a risk in some quarters that light may be regarded as a panacea of almost universal applicability. The broad principles of sun treatment remain unaltered, and the good results to be obtained from heliotherapy in *surgical tuberculosis* are shown in reports from many sources which need not be detailed.

It is always to be borne in mind that a local tuberculous lesion is but a

manifestation of general disease, and that whatever local treatment, light or otherwise, may be adopted, general treatment is also indicated. For such general treatment, exposure to light is of course a most valuable concomitant of other hygienic measures. Heliotherapy is admittedly superior to artificial light therapy for that purpose. In explanation of this superiority one of us (H. J. G.) has put forward a theory of light as applied in the treatment of surgical tuberculosis which urges the importance of basing our findings on the sum total of the effects caused by exposure to the sun, and not simply planning and conducting treatment on certain specific effects which may be produced. For the full consideration of this important matter the reader is referred to the *Lancet* for April 9, 1927.¹ The arguments there advanced are equally applicable to the conduct of general light treatment in other conditions than tuberculous disease.

In the case of *pulmonary tuberculosis* the issue is less clear and depends to a great extent on the clinical type and severity of the disease. Judging by experience and papers concerning this subject, the general position has been reached that heliotherapy and other light treatment is likely to be effective in the chronic fibrotic type of case through the augmentation of natural resistance; but for the active case, whose resistance is seriously depleted, exposure to the sun's rays or to artificial radiation is fraught with grave risk, since it may light up quiescent foci to greater activity and convert a relatively favourable case into one of grave severity. It must be considered that in all cases of pulmonary tuberculosis at whatever stage, light treatment to be effective and beneficial must be rigorously graded and individualized according to the reaction of each patient, especially in the matter of temperature. Exposures to the sun are best given in cool air, for over-heating is sedulously to be avoided. The use of the carbon arc in the light treatment of pulmonary tuberculosis has been especially favoured in Scandinavian countries, and the light department at the Viejlefjord Sanatorium may be instanced as one where such treatment is admirably conducted, and with benefit to the patients concerned. In this country attention may be especially directed to light treatment (both natural and artificial) at King George's Sanatorium, Bramshott.

A new method has been described for the *measurement of dosage of sun baths*. An actinometer is used to estimate that number of calories which is received by a unit of one square centimetre of surface. The number of calories is, of course, subject to variation with the hour of the day and the season. Knowing the figure at any given time, a dose of light may be ordered in terms of calories, and since this is, as it were, an absolute measurement, a due comparison can be obtained of the intensity of sunshine in different parts of the world. It has also been made possible to work out from the caloric value what percentage of infra-red and ultra-violet waves are also present in the light.

The subject of *rickets* is one which has been given much attention both clinically and experimentally, particularly in view of the fact that its radiological features and the shortage of calcium and phosphorus in the blood are phenomena which can be measured with accuracy, and because the amendment of the abnormalities by irradiation or the feeding of irradiated materials is specifically related to ultra-violet light. The same considerations apply to other clinical conditions in which there is calcium deficiency—spasmophilia and tetany.

It is now well known that ultra-violet light can cure or prevent rickets in children or in the experimental animal, and it is also known that the exposure of certain substances to the rays confers upon them a similar healing or prophylactic power when they are fed to the subject. Such a substance is

cholesterol, or more accurately the ergosterol which is associated with it and which has been isolated from it. Further work has helped to elucidate the *modus operandi* of this phenomenon. Ergosterol when in the impure state with cholesterol shows absorption bands in the ultra-violet at 2650, 2760, and 2930 A.U. Now when vitamin D is produced by irradiation with ultra-violet light, these absorption bands disappear. When by chemical purification the provitamin of vitamin D is eliminated, the absorption bands are no longer seen and simultaneously antirachitic power is lost. There is thus good evidence that the antirachitic substance, as it occurs in nature, is closely related to, if not identical with, ergosterol.

Our usual sources of vitamin D are butter and milk, and its presence in these products is closely related to the sunshine to which the cows are exposed, so that the vitamin yield is distinctly less in winter than in summer. For medicinal purposes, cod-liver oil, which has a much greater content of vitamin D than butter and milk, has been in use for a long time. But even in this, and in other fish oils, the amount of vitamin is variable, and it is therefore an important advance that vitamin D can be manufactured synthetically from cholesterol; the utility of such a substance which can be administered in accurate doses is obvious, and must find application especially for prophylaxis in light-starved industrial communities.

The rickets of children and the rickets produced in animals by suitably deficient diet, and light starvation, have some important points of difference; it is thoroughly established that the furred animal can be effectively treated for rickets by such a source of light as the mercury-vapour lamp. Child rickets can also be effectively treated by the same means, and it has been supposed that the sterol in the child's skin became activated by the light and was subsequently absorbed from the skin into the blood-stream as vitamin D, to act in improving the absorption of calcium from the intestine. But in the furred animal the same process can hardly be thought to occur, for the fur would speedily absorb and render ineffective the short ultra-violet rays, which are known to be antirachitic. It was shown that when a number of rats are placed on a rickets-producing diet and some of them exposed to ultra-violet light, the unirradiated remainder are protected as well as the irradiated rats; further, some rats on a rickets-producing diet were exposed to the mercury-vapour lamp in such a way that they were prevented from licking themselves: these rats developed rickets in spite of the radiation, while controls irradiated without the special apparatus and allowed to ingest their own secretions were duly protected from rickets. It must be supposed therefore that the rat is protected in an indirect fashion by the absorption of its own or other secretions, and especially the cholesterol which is abundant in the sebum.

Erythema and pigmentation are, of course, dependent on the amount of ultra-violet radiation to which the skin is exposed, but their intensity has also been shown to vary according to the state of engorgement or otherwise of the vessels, so that when the part is reddened, as by a hot bath, the erythema production is greater than otherwise, and when the part is rendered ischæmic, the erythema is less. Recognition of the fact that it is only when rays are absorbed that they can have effects has led to much work upon the degree of such absorption at various wave-lengths by the tissues and their constituents. It has been determined with accuracy that the skin absorbs a large proportion of infra-red rays from a mixed source, and that the absorption in the visible spectrum is greatly increased when the skin is rendered bloodless, as in the Finsen treatment of lupus. It has also been determined that the transparency of skin to short-waved rays can be increased by inunction with glycerin, and this applies also to the transmission of the bactericidal rays. It is likely that

this discovery may find practical application, since it would be possible to get the ultra-violet rays to reach greater depth than is at present feasible.

Sensitization by such a substance as tryptaflavine has been known to occur during the administration of that substance for therapeutic reasons: there resulted in a blond severe sunburn, and in a subject already of dark colour a more intense pigmentation.

An important part of the action of light has been referred by Much and others to its *action on lipoids*, which form so essential a constituent of the body. It is by reference to this that the deleterious action of light on milk is to be explained; for this spoiling of milk by light can occur even at ice temperature and when the milk is sterile. It thus differs from rancidity. It is likely that many light phenomena will be understood when more is known of the relations between light and lipoids. It is notable, for example, that toxins—for example, cobra venom—can be destroyed by ultra-violet light, and the relation of toxins such as this with lipoids has been made apparent by many observers. Further, experiments in which plants were sprinkled with solutions of various lipoids such as lecithin and cholesterolin and then grown in light, showed how important a rôle such substances must play in the plant, and presumably in the animal, economy. The high content of nerve tissue in lipoids suggests that lipid treatment, perhaps concomitantly with actinotherapy, may come to be useful in nervous disorders.

Nagelschmidt has offered a working hypothesis which may be used to explain many phenomena of light biology. He sees in *bioluminescence* a feature which is not limited to any special group of physiological substances. The phenomena of fluorescence are well known but will repay further study, but such fluorescent substances as are known are merely the obvious ones such as one investigates with ultra-violet light as filtered through Wood's glass. Phosphorescence is taken to differ from fluorescence not in kind but merely in degree. Nagelschmidt maintains that the whole range of life is permeated with changes wrought by the alternate luminescence and deluminescence of bodies in the biological economy. It is to be noted that he is looking upon the phenomenon of luminescence in a very broad sense, which includes much more than the obvious, for it is known that there occur exchanges of light energy for which the visible and infra-red rays are responsible. He takes the example of rickets, and noting that it is in reality a complex collection of morbid conditions, remarks that its cure by irradiated cholesterol, or, more precisely, ergosterol, is evidently bound up with the fact that whereas non-irradiated sterol fluoresces in ultra-violet light and is at the same time inert antirachitically, it loses fluorescence when exposed for some time to ultra-violet light and at the same time becomes antirachitic. It is to be concluded that even rays of closely related parts of the spectrum may be synergetic or antagonistic. Each substance may acquire luminescence in one wave-length, and a neighbouring part of the spectrum may blot it out. Our day-night routine may be explained by referring it to the hypothesis: we are bathed in the daytime in visible rays which excite luminescence, and at night in infra-red rays passing from earth to sky and bringing about deluminescence; the normal flow of life may be conceived as depending on such a cycle of energy transformations, and concomitantly with them are other daily physiological changes, such as those of temperature and of tonus in the vegetative nervous system.

Nagelschmidt has also developed a practice of light therapy in which *monochromatic waves* are employed. He notes that when small-pox is treated by monochromatic red rays the amount of scarring from the pocks is much reduced and the whole disease runs a more benign course than when pure daylight is allowed to act.

For some workers the scope of light therapy has been extended in various directions. Thus, cases of *anterior poliomyelitis* have been treated by ultra-violet radiation with alleged encouraging results, and the importance of the red rays has been insisted upon in dealing with the restoration of muscular activity in that disease. Good results have been claimed in *encephalitis lethargica*, and there has appeared a paper recounting the encouraging effects of intensive radiation from the mercury-vapour lamp of cases of encephalitis with Parkinsonism; some case-notes indicate that improvement was induced by such treatment when other therapy had failed.

Numerous reports have been made of experiences at *infant welfare clinics* all over the country; these are generally favourable, and the treatment has been extended with success to nursing mothers.

Light treatment has been extensively applied to cases of *skin disease*. It is stated that, for the mercury-vapour lamp to be effective in *crysipelas*, the dose must be a heavy one. Huldchinsky discusses the relation between *syphilis* affecting the skin and that attacking the nervous system, and judges that the skin plays a part of the nature of autovaccination against further inroads of the disease. He suggests an analogy with rickets, and thinks that erythema doses of light can protect against the later manifestations of syphilis of the nervous system—including G.P.I. He points out that in modern treatment of that disease the induction of fever plays a prominent part.

A review of work done with light at the London Hospital² will repay perusal, especially by those interested in the treatment of skin diseases; the end-results in many cases, and particularly in *lupus*, are detailed. The great value of general as well as local light baths in *lupus* is convincingly brought out.

The technique of the treatment of *X-ray ulcers* by means of Finsen light has been perfected by Dr. Reyn, of the Finsen Institute. Reyn advises the use of Finsen-light treatment with compressors for these ulcers by local application given on the periphery of the ulcers, application being made for periods extending from 5 to 25 minutes. The reaction following such treatment causes improved nourishment of the part affected, and in successful cases this results in a gradual healing of the ulcers. The length of exposure should not exceed as a rule 20 to 25 minutes, and shorter exposures are at first indicated. Too long exposures cause considerable pain. The exposures should be repeated as soon as the resulting reaction has subsided. We have personally adopted this method with highly satisfactory results.

There has been a general belief that *senile cataract* is in some way related to exposure to ultra-violet light, but a recent discussion (Birch-Hirschfeld) has cast doubt on this; the part played by light of any kind is regarded as a small one, the essential factor being perhaps a disturbance of an endocrine sort.

Methods of Artificial Light Treatment.—There has occurred much discussion concerning the ideal lamps for various purposes: the chief of those used in clinics are the mercury-vapour and carbon-arc lamps, and each has its advantages; the mercury-vapour lamp gives a light containing much ultra-violet, it consumes only a moderate amount of current, and is therefore relatively inexpensive once it has been put up, requiring only occasional renewal of the quartz container. On the other hand, the carbon arc necessitates the use of a heavier current and demands the frequent renewal of its electrodes. But the carbon arc gives a light more nearly approaching that of the sun, and is on the whole the more effective light. If a higher quota of ultra-violet is desired than is given by the plain carbons, various materials, such as tungsten, cerium, etc., may be incorporated as cores, and have the effect of increasing the ultra-violet output.

Alexander has pointed out the advantages of the tungsten arc for experimental purposes. The well-known work of the Finsen Institute is carried on with an armamentarium which has been detailed by Reyn, and an improved pattern of the Finsen lamp has been described by Lomholt of that institute. There has been suggested a novel type of carbon-arc lamp in which the electrodes lie parallel to one another, and it is stated that such an arrangement has advantages in efficiency, as it eliminates the throwing of shadows.

Hörnícke has constructed a new type of irradiation chamber sufficiently large to contain a patient and lined with reflecting material arranged at suitable angles, so that the subject receives a uniformly distributed irradiation from two mercury-vapour lamps contained in it: in this way he overcomes the difficulty of administering general irradiation from such lamps.

Owing to the finding that ultra-violet waves have so great an importance in the development of the young, and in the calcification of bone particularly, much research has been made upon the *ability of various glasses or their substitutes to transmit or obstruct these rays*. From the many papers that have appeared on the subject it is evident that ordinary window glass obstructs and absorbs the shorter, invisible rays to a great extent, while such materials as vita-glass and cellophane allow the passage of a sufficient extent and intensity of them to protect from disease or cure rickets in experimental animals. It seems likely that, when cost permits, such materials should have distinct value in the roofing of solaria and balconies under which nude patients may be exposed. The quality of the glass has a much greater importance in this respect than surface dust upon it, for the latter has but an insignificant effect in obstructing ultra-violet radiation.

It is desirable to note that the indiscriminate use of lamps emitting intense ultra-violet radiation may lead to the disrepute of light treatment, for the neglect of simple measures to prevent burning and photophthalmia is likely to be followed by these accidents: the importance of manipulation and dosage should be insisted upon.

REFERENCES.—¹*Lancet*, 1927, i, 754. ²Sequeira, J. H., and O Donovan, W. J., "Some Observations on Light Treatment at the London Hospital", *Lancet*, 1927, ii, 1118.

PLAGUE.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY.—L. F. Hirst¹ has published a valuable monograph on researches on the parasitology of plague, giving in 300 pages a summary of the literature of the subject, and developing his well-known theory regarding the distribution of plague in India being related to the good carrier powers of *Xenopsylla cheopis*, as compared with the much less efficiency in this respect of *X. astia*, the latter being the prevalent flea in areas of little plague, such as Bengal, Madras, and Ceylon. He points out the grave danger of *X. cheopis* being introduced by commerce into ports previously free from it, as appears to have occurred already in the case of Colombo. The same thesis is dealt with more briefly in a further paper by the same worker.² A. N. Goyle³ agrees that *X. cheopis* is a much more efficient carrier than *X. astia*. J. A. Mitchell⁴ summarizes recent work in South Africa in a paper giving illustrations of gerbilles, the multimammate mouse, and other South African plague-infected animals. K. Hanna⁵ deals with plague in Egypt, where the dry climate of Lower Egypt is unfavourable for its spread as compared with the Upper Provinces. As prophylactic measures, inoculation of all contacts and rat destruction are advocated, and kerosene emulsion is used in place of disinfectants for killing fleas in infected houses. J. Raynal⁶ reports an outbreak at Diego-Suarez, in Madagascar, in which serum treatment even in the first three days of the disease gave disappointing results, but prophylactic

inoculation proved of value. A. Connal,⁷ in an outbreak at Lagos, studied the rodents and their ecto-parasites, and found the rise in the human curve followed a week after that in *R. rattus* as elsewhere. *X. cheopis* was the most common rat-flea, followed by *X. brasiliensis*, about half as numerous. C. L. Williams⁸ reports interesting experiments to study late bacteriæmia and resolving plague in rats met with in the course of inoculation of the disease into 2278 wild rats, with the result of demonstrating the presence of plague bacilli in the blood of certain rats diagnosed as resolving cases.

TREATMENT.—B. P. B. Neidu and S. Jung⁹ have tried the treatment of plague-infected animals with *Mercurochrome-220* in rats and rabbits, in 10-mgrm. doses in rats, without obtaining any effect on the progress of the disease; D. A. Turkhud¹⁰ suggests the injection intravenously of *Hypertonic Saline* in plague on theoretical grounds, but records no trials of the plan.

REFERENCES.—¹*Ceylon Jour. Sci.* Sect. D., i, Part 4, 1926, Dec. 18, and Part 5, 1927, April 30; ²*Trans. Roy. Soc. Trop. Med. and Hyg.* 1927, Aug., 87; ³*Ind. Med. Gaz.* 1927, June, 317; ⁴*Publications S. African Inst. Med. Research*, No. XX; ⁵*Jour. of State Med.* 1926, Aug., 478; ⁶*Marseille-méd.* 1926, Dec., 1927; ⁷*Ann. of Trop. Med. and Parasitol.* 1926, Dec. 17, 341; ⁸*Amer. Jour. Trop. Med.* 1926, Sept., 367; ⁹*Ind. Jour. Med. Research*, 1926, Oct., 323; ¹⁰*Ind. Med. Gaz.* 1926, Aug., 387.

PNEUMONIA.

W. H. Wynn, M.D., F.R.C.P.

PROPHYLAXIS.—C. J. Vaux,¹ stating that pneumonia ranks first among acute communicable diseases as a cause of death, makes a strong plea for such preventive measures as *Isolation and a Modified Quarantine*. Notwithstanding our lack of knowledge regarding many probable factors in the epidemiology of pneumonia, sufficient data have accumulated to warrant definite steps. In the past, pneumonia has been attacked from the standpoint of the individual. The disease has not been regarded as sufficiently contagious to warrant public health measures, contact cases were thought to be uncommon, and it has been taught that the pneumococcus is a common inhabitant of the human mouth. We now know that contact cases are by no means unusual. In one month in Pittsburg, twenty-two multiple deaths in households, due to pneumonia, one death closely following on another, were investigated. No large group of cases has yet been investigated from this point of view. Also a person with good resistance may partially throw off an infection received from a pneumonia patient, and he suffers from an upper respiratory tract infection or bronchitis instead of pneumonia. The pneumococcus found in the mouths of healthy persons is nearly always an organism of low virulence. The highly virulent types responsible for pneumonia are found only in pneumonia patients or occasional carriers, patients recovering from pneumonia, or those who have been in contact with pneumonia patients. Direct contact even is not essential, as the pneumococcus is a tenacious organism which may retain its virulence in sputum for as long as fifty-five days. Pneumonia quarantine was begun in Pittsburg in April, 1924. The regulation is as follows: "Pneumonias (all forms) are reportable diseases in the city of Pittsburg; specify (a) lobar pneumonia, (b) bronchopneumonia, (c) pneumonia complicating influenza, (d) pneumonia complicating other communicable diseases, (e) all other pneumonias, as traumatic, anæsthetic, senile, etc.; specify whether lobar pneumonia or bronchopneumonia in all of the above primary conditions". The quarantine is a modified one: "Modified quarantine will be enforced in all cases of pneumonia, except that under the classification (c) the quarantine is under the option of the department of public health. This modified quarantine will consist of placarding, isolation of the patient, prohibition of all visitors, but no restrictions on other members of the household, including school children, provided isolation is complete and instructions from the department of public

health are properly carried out. No minimum number of quarantine days are specified, the quarantine period being until recovery or death of the patient". Complete sanitary cleaning of the premises is required before release, but when this is accomplished thoroughly following the physician's report of recovery, quarantine release is made at once. These regulations are regarded as an essential first step in pneumonia control. The second step will be to arouse interest in the general public and the medical profession on the subject of pneumonia prevention. The third step is organized study of the unknown items in the epidemiology. The result of the quarantine in Pittsburg is shown by the following table :—

	Number	Rate per 100,000
Deaths from pneumonia (all forms) in 1923 (last year of no quarantine)	2295	371
Deaths (all forms) in 1924 (quarantine last nine months)	2074	331
Deaths (all forms) in 1925 (first full year of quarantine)	1688	264

There was thus a reduction of 607 deaths, or about 26.5 per cent, for the first full year of quarantine, as compared with 1923, the last year of no quarantine.

It may be true that there were not so many deaths from pneumonia in the United States in 1925 as in 1923 or 1924, but in 18 other cities of 300,000 or over there was an increase in 11 and a decrease in 7. The two cities showing the greatest decrease were Pittsburg with 18.6 per cent, and Washington, D.C., with 20 per cent, both of which had quarantine for all forms of pneumonia. For the first ten months of 1926 there was a further decline. Taking the first ten months of each year the deaths were as follows :—

	Total	Rate per 100,000
Jan. 1 to Nov. 1, 1923 ..	1933	319
Jan. 1 to Nov. 1, 1924 ..	1768	282
Jan. 1 to Nov. 1, 1925 ..	1400	223
Jan. 1 to Nov. 1, 1926 ..	1070	168

TREATMENT.—H. S. Baldwin and R. L. Cecil² discuss the rationale of specific therapy. Pneumococcus immunity probably depends on a number of factors, such as agglutinins, precipitins, and opsonins, but the most conspicuous and important of these substances are the so-called protective bodies. They receive the name from the fact that mice, when they are injected with virulent pneumococci, may be protected from death by the simultaneous injection of a certain amount of antipneumococcus serum. Dochez found that patients recovering from pneumonia developed protective bodies about the time of the crisis. While the human body is manufacturing protective substances against the pneumococcus, the pneumococcus in turn is producing a substance which has the power of neutralizing the protective bodies. This has been called the S substance. It is rigidly specific for each type of pneumococcus. Analysis of fatal cases of pneumonia shows a high incidence of bacteriemia in these cases. Blood cultures were taken from 107 patients, with the following results :—

Type	CASES SHOWING POSITIVE BLOOD CULTURES			CASES SHOWING STERILE BLOOD CULTURES	
	Cases	Cases	Deaths	Cases	Deaths
I	39	11	6	28	3
II	22	14	13	8	1
III	11	4	3	7	1
IV	35	8	7	27	2
	107	37	29	70	7
			(78.3 per cent)		(10 per cent)

The death-rate was lower in Type I than in the other three types, but this was probably due to serum therapy. The incidence of positive blood cultures was roughly proportional to the respective death-rates. The occurrence of bacteraemia in the less virulent Type I and Type IV infections is comparatively low. The death-rate of 78.3 per cent in the cases with positive cultures contrasted with 10 per cent in those with sterile blood.

In a series of 25 cases in which blood was taken to determine the presence or absence of protective bodies at various intervals, 8 cases showed protective bodies present for the first time at, or just before, the crisis; 12 showed protective bodies at least two days before the crisis; and 5 cases showed no protective substance whatever during the course of the infection, and all died. Although the great majority of patients who develop protective substances recover, there may be high toxæmia, and death may occur in spite of their presence. Pneumococci and protective substances were very rarely found simultaneously in the blood. By administering early a sufficient amount of homologous protective substance in the form of Immune Serum, it is often possible in both Type I and Type II infections to establish a balance of protective substance in the patient's blood and thereby check pneumococcus septicæmia. There are three specific therapeutic agents, more or less similar: (1) The Type I antipneumococcus serum of Cole; (2) Huntton's pneumococcus antibody solution; and (3) Felton's concentrated antipneumococcus serum. All three derive their efficacy from the protective bodies which they contain, and they differ only in their content of horse protein and their concentration of antibodies. All prevent or check pneumococcus septicæmia, and when administered early produce an abortive pneumonia. These statements refer chiefly to Type I pneumonia, and are true only to a less extent of Type II, but they have no effect on Type III or IV. Huntton's solution is practically free from horse proteins, and can therefore be injected without risk of anaphylaxis or serum sickness. Felton's serum contains a comparatively small amount of horse serum and a high concentration of protective bodies. It requires about 100 c.c. of antipneumococcus serum or antibody solution to establish a balance of protective substances in the blood, whereas such a balance can be obtained with from 5 to 10 c.c. of Felton's Type I serum.

Wynn,³ taking part in the discussion on the treatment of pneumonia at the annual meeting of the British Medical Association, advocated the early administration of a Vaccine of pneumococci made from primary growths under twenty-four hours old. For an adult at least 100 million were injected. In 100 consecutive patients, 49 were injected during the first three days and only one died, and she was a pregnant woman who had been a chronic asthmatic and was confined forty-eight hours after the onset of the disease. Of 51 injected after the third day, 12 died. This showed the importance of treatment before dangerous intoxication occurred. The chief obstacle to the use of vaccines appeared to be the fear of a reaction or negative phase; but this occurs only in a patient who is sensitized, whose cells are allergic owing to the presence of specific antibodies. If antibodies are absent there is no sensitization and no reaction. Specific antibodies are present in all states of chronic infection, but in acute infections they are present only after a certain interval has elapsed. It is this interval after infection and before sensitization that affords us the opportunity of intervening safely with an injection of a fairly large amount of vaccine without fear of producing a reaction. In pneumonia the curve of intoxication rises rapidly and then remains fairly steady, corresponding roughly with the temperature chart. At first antibodies are absent, but about the fourth day they begin to be present; the rise of the curve is at first slow, then rapid, and about the end of the week the antibody curve overtakes the curve

of intoxication and in favourable cases a crisis occurs. The problem is to produce an early rise in antibody while the curve of intoxication is still ascending and easy to overtake, and before the toxins are fixed in dangerous amount in the heart and nerve-cells. There is an interval in which the patient is unsensitized, and it is found that if during that interval we inject an adequate amount of a suitable vaccine we can to a large extent control the infection. The first action of the vaccine appears to be a non-specific one; it is far too rapid for the production of specific antibodies, which appear later as an after-effect.

Gardner-Medwin⁴ finds that all types of pneumonia respond to a single dose of Sodium Nucleinate injected intramuscularly, the pneumonic process being terminated in forty-eight hours after its administration. L. E. Miller⁵ used sodium nucleinate in 87 cases of lobar pneumonia and 30 of bronchopneumonia. The dose was 0.1 grm. injected intramuscularly and repeated if necessity in forty-eight hours. Of the 87 cases of lobar pneumonia, 7 died; 24 had a crisis on the second day after injection, 18 on the third day, 4 on the fourth day, 4 on the fifth day, and 1 on the sixth day. In 16 the temperature fell by lysis, and 20, including the fatal cases, were uninfluenced by the treatment. Of the 30 cases of bronchopneumonia, 10 died; 7 had a crisis on the second day after injection. Most of the cases showed a definite increase in the leucocytosis after the injection. Morley Fletcher⁶ had been unable to confirm the results obtained by Gardner-Medwin with sodium nucleinate.

J. Hay⁷ is convinced that Alcohol is only of use to pneumonic patients under certain well-defined conditions, and that it is not only futile but detrimental when administered in repeated doses to help a failing heart. It may be of service in procuring rest and sleep during the acute stage. It may be comforting given in a hot drink during the initial rigor; but to give alcohol in the belief that it is a cardiac tonic or stimulant is opposed to scientific teaching and clinical experience. One most important action of alcohol in the blood-stream is its effect on the immunizing response. Alcohol has been proved to inhibit this vital activity upon which recovery depends. He had treated under carefully observed conditions 47 patients without alcohol and 103 with alcohol. On certain days every case admitted to the wards was treated without alcohol, and on other days the patients admitted were given alcohol. The average age in each class was the same. Excluding cases which died within twenty-four hours after admission, the results were that of 42 cases without alcohol 9 died—a rate of 21.4 per cent. Of 87 cases given alcohol, 31 died—a mortality of 36.8 per cent. Wynn states that no proof has yet been advanced that alcohol is of service in cardiac failure, and to give, under the guise of a stimulant, a depressing drug which, moreover, inhibits the immunizing response, to patients who are unable to neutralize its effect, cannot be sound treatment.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1926, Dec. 11, 1980; ²*Ibid.* Nov. 20, 1709; ³*Brit. Med. Jour.* 1927, ii, 480; ⁴*Ibid.* 483; ⁵*S. African Med. Record*, 1926, Dec. 11, 531; ⁶*Brit. Med. Jour.* 1927, ii, 482, ⁷*Ibid.* 477.

PNEUMONOKONIOSIS. (See SILICOSIS.)

POLIOMYELITIS, ACUTE.

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

Serum Treatment.—At the Pasteur Institute in Paris, Pettit has prepared an antipoliomyelitic serum which is specially applicable when cases of poliomyelitis occur in epidemic form and are thus more readily recognized within a few days after the onset. Etienne,¹ of Nancy, has recently been able to employ this serum in a series of 17 cases. He records his results under three

headings. Firstly, in 9 patients not treated by serum, 1, a very slight case, recovered almost completely; 1 died; 4 remained completely paraplegic; 3 were left with severe residual muscular atrophy and weakness of one or more limbs. Of the 17 patients treated by intravenous or intrathecal injections of serum, 3 were already *in extremis* and succumbed within a few hours from cardiac or respiratory failure. In the remaining 14 cases, 11 were given adequate doses of serum, whilst in 3 the serum was not available in sufficient quantities to pursue the treatment. Nevertheless 2 of these were definitely arrested, leaving a certain amount of permanent paralysis behind, whilst the third, after a temporary improvement, succumbed later to a fresh attack of bulbar symptoms.

Of the 11 cases in which the serum was administered in adequate doses, 9 made a complete recovery; 1, a diabetic of 62, died from acute bulbar symptoms notwithstanding an initial improvement in his paraplegia; whilst another patient, age 40, in whom the serum was not administered until seven weeks from the onset, cleared up with the exception of slight weakness of the dorsiflexors of one foot. In the 9 completely successful cases the serum treatment was begun on the following days: 3rd, 4th (twice), 5th, 7th, 9th, 18th, 39th, and 60th day respectively.

The doses of serum were as follows: 100 c.c. administered in a total period of 7 days; 110 c.c. in 5 days; 160 c.c. in 4 days; 260 c.c. in 11 days; 310 c.c. in 4 days; 350 c.c. in 5 days. Etienne begins with an initial dose of 20 c.c., 10 c.c. of which is given intrathecally, and progressively increases the intravenous or intramuscular dose to 40, 50, 60, 80, 100, and 110 c.c. daily. If only a limited amount of antipoliomyelitic serum is available, Etienne prefers to give a large dose straight away, rather than a small dose followed by still smaller quantities on later days.

REFERENCE.—*Presse méd.* 1926, Sept. 18, 1185.

POTT'S DISEASE. (See SPINE, TUBERCULOSIS OF; TUBERCULOSIS OF BONES AND JOINTS.)

PRE- AND POST-OPERATIVE TREATMENT OF COMPLICATIONS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Attention has been called in previous numbers of the MEDICAL ANNUAL to the necessity for more systematized pre-operative and post-operative treatment; but there is no finality in surgery, and each year brings more and more scientific information on this subject. The salutary custom of giving quantities of fluid for some days before, and to add to the fluids **Glucose** and **Alkalis**, so that any approach to acidosis may be avoided, is followed by most workers. In gastric cases, especially if resection is contemplated, washing out of the stomach immediately beforehand is a wise precaution. The proximal clamps can then be more comfortably applied without danger of forcing the contents of the stomach up through the œsophagus, with the possible production of aspiration pneumonia. If the stomach is not washed out and is found distended at operation, it can be emptied with an aspirator through a small opening in the anterior wall. If liquid paraffin is used as an aperient before or after operation (two tablespoonfuls every night and one tablespoonful in the morning), it is well to use a preparation of high viscosity, such as **Colonol** or **Internol** (MEDICAL ANNUAL, 1927, p. 401). Nutrient enemata are relics of the substitutions of the past. Prior to operation, in poor surgical risks, adequate carbohydrate nourishment is necessary; e.g., the patient may be given barley-sugar without limitation. Great improvement can be brought about in patients with bad hearts by the intravenous injection of glucose. Glucose injected

intravenously probably has some direct action on the heart muscle, and in addition it is one of the best diuretics available. The value of glucose as part of the post-operative treatment is not quite so certain. David Levi¹ undertook some experiments to ascertain (a) whether glucose is absorbed from the rectum in sufficient quantities to make the glucose enema of clinical value, and (b) the place of the glucose enema in the treatment of post-operative shock. The blood-sugar was estimated before and after operation. In every case there was a rise after operation: the more serious the operation, the longer the blood-sugar took to return to its pre-operative level. Therefore, in the state of post-operative shock the body is permeated with blood containing an excess of sugar which the tissues seem to be unable to utilize. Levi comes to the conclusion that very little sugar can be introduced into the body by the rectum and colon, but their power of absorbing glucose varies in different subjects. The subjects of post-operative shock are in a state of hyperglycæmia and seem to be unable to utilize sugar normally, although their tissues are bathed in a fluid containing an excess of this substance. A glucose rectal saline given under these circumstances is not only useless but actively harmful, as the absorption of fluid from the bowel is hindered by the presence of glucose. According to Levi it is rational to administer insulin to patients in a condition of post-operative shock. Further investigations are being made in this direction.

D. Fisher² discusses the **Insulin-Glucose** treatment of *shock*. The laboratory aspects of the problem mentioned in this paper appear rather to controvert the statements made by Levi. The changes in the chemical constituents of the blood following a Marathon race are mentioned. A correlation was found between the blood-sugar level and the physical condition of the runner at the finish. Those who had a normal sugar content showed no signs or symptoms of shock; those who were prostrated had a very low blood-sugar and presented the typical picture of an overdose of insulin. In shock, glucose administered alone may not supply the energy needed quickly enough to revive the dying cells. The introduction of insulin causes a rapid oxidation of the glucose and supplies the energy needed. Fisher believes strongly that there is a great advantage of insulin and glucose over glucose alone. A sterile solution is used, preferably of 10 to 15 per cent strength; 500 to 2000 c.c. may be given. The solution is allowed to flow slowly into the veins, so that the entire time of administration should be at least one hour, and preferably two to four hours. This precaution is extremely important when any large amount of fluid is introduced into the veins, for dilatation of the right heart is a real danger. The amount of insulin used depends upon the amount of glucose injected. For every 3 gm. of glucose, one unit of U 20 is the average dose. The total amount of insulin should be divided into two equal doses; one part is given about fifteen minutes after the administration of the glucose has started, and the remainder at the end of administration. As long as glucose appears in the urine, there is no danger of an insulin reaction. It is well to have ready a hypodermic syringe of adrenalin in order to counteract quickly any possible reaction. The juice of an orange or ordinary cane sugar can also be used. Aside from employing it in non-diabetic acidosis and surgical shock, the authors consider insulin and glucose of use in the *persistent vomiting of acute peritonitis*. They are indicated also in *pernicious anæmia*. In analysing this paper and the discussion, it would seem that 300 c.c. of a 10 per cent solution given by the tube method intravenously, so that about one hour is taken in its administration, is the ideal procedure. Fifteen units of insulin are used for this amount—half to be given about fifteen minutes after the glucose has been started, and the remainder at the end of administration.

Unexpected Post-operative Deaths.—Rendle Short and A. D. Fraser,³ in a very interesting communication, point out that it is not probable that sepsis, *per se*, gives rise to the bulk of the post-operative complications. Many of the deaths reported by them occurred in clean cases; pneumonias rarely followed operations for cellulitis, pyæmia, and abscesses. Several factors must be regarded as possibly acting. The operative procedure on the upper abdomen probably gives rise to reflex inhibition of the diaphragm, which in its turn is followed by collapse of the lung, and that again by infection. Minute emboli carrying germs may be a factor. The anæsthetic plays some part, no doubt, but not so large a one as was until recently supposed. Inhalation of vomit may sometimes occur. The subject has been reviewed within the past year by Featherstone, of Birmingham, after study of a considerable volume of statistics. He thinks inhibition of the diaphragm is the principal cause, and the frequency of lung complications after upper abdomen operations is certainly suggestive of this. According to Grégoire, previous gastric lavage and the substitution of local for inhalation anæsthesia reduce the incidence of post-operative pneumonia in gastric cases from 21 to 9 per cent. And how may we attain the greatest success in avoiding this most dangerous sequel? First, and principally, by the collection of evidence as to the exact cause. Until that is more accurately known very little progress is likely. On our present information the following rules may be laid down: (1) To avoid as far as possible operating on persons with bronchitis, or to operate under local anæsthesia. (2) Careful guarding against inhalation of vomit. (3) As little moving through cold corridors as possible on the way back to bed. (4) The use of novocain or quinine-urea to reduce the inhibition reflex in upper abdomen operations; no drainage tubes just under the liver to impede its descent; no tight binders. (5) After returning to bed, to prop the patient up when possible, and coax him to draw deep breaths as soon as conscious.

The reviewer⁴ has pointed out that after certain abdominal operations pulmonary complications may arise, whether the anæsthetic is administered by the rectum or by any other method, and often follow the employment of local anæsthetics alone. In the acute upper abdomen the diaphragm becomes rigid by the same mechanism which causes rigidity of the recti muscles. There is a general reflex splinting of the whole area involved; and in consequence the diaphragm cannot descend. This fixity of the diaphragm produces œdema of one or both lungs, and fine pulmonary crepitations can be heard at the base in most cases. These crepitations must not be mistaken for commencing pneumonia with reflex abdominal rigidity and pain. Wilkie thinks that crepitations at the base of the lung are an additional sign of acute infections of the biliary tract, but they have a far wider significance. If œdema of the lung is produced by the fixed diaphragm before operation, the condition is still more common after high abdominal operations. It must be within the knowledge of all surgeons of experience that high abdominal operations are very frequently followed by severe cough and expectoration for the four or five days after operation, subsiding after relief of intra-abdominal tension by the first satisfactory evacuation of the bowels. Crepitations at the base of the lungs may be a sign in favour of an acute upper abdomen, and not against. In agreement with Short and Fraser he believes that the subcutaneous tissues should be infiltrated first and the deeper tissues afterwards, before the incision is made, with a $\frac{1}{2}$ or 1 per cent novocain and adrenalin solution, thus blocking off as far as possible the operation area from connection with the cerebrospinal centres. Complete relaxation of muscles is obtained, and the anæsthetic solution, finding its way along intermuscular and interfascial paths, renders the various layers to be divided plain and distinct. Bleeding is reduced to a

minimum, and in the blanched area nerves and blood-vessels stand out in a manner only seen in the dissecting room. He thinks there is no doubt whatever that the shock of an operation is considerably decreased, and the short time and labour involved in the infiltration of a local anæsthetic is repaid a hundredfold.

Pulmonary Embolism.—Short and Fraser, in the same paper, state that what had been diagnosed as pulmonary embolism generally turned out to be sudden cardiac failure. Only two cases of pulmonary embolism appeared in a ten-years' series. K. Speed³ points out that the fatal occurrence of pulmonary embolism after operation still remains somewhat of a clinical mystery. He makes a study of 30 cases from the records of the Presbyterian Hospital, Chicago, in the past fourteen years. Massive embolism commonly occurs within a week after operation; pulmonary infarction is to be expected in the second or third week. The treatment is, of course, largely prophylactic: (1) The pre-operative preparation most employed is directed to cure the foci of infection, such as teeth, tonsils, or infected sinuses. At the Presbyterian Hospital, dental oral prophylaxis is applied to all patients. Digitalis should be given if the pulse is small or the systolic blood-pressure too low. The routine preparation, by increasing the body fluids by transfusions with salt or glucose solutions or blood, is also applied, and the patients are not starved before operation. (2) At operation the advice is given to use no constrained position of the patient, to avoid pressure anywhere on the body during operation, or any position which promotes venous stasis, especially in the legs. It may be necessary to have a suitable mattress on the operating-table, or to have the limbs held in the arms of assistants rather than by mechanical means (Trendelenburg position). Blunt dissection should be avoided or reduced to a minimum; rough clamping or packing in of sponges is undesirable. Pressure by retractors on small branches of the epigastric veins may start thrombosis. (3) Post-operative care: Tight bandages around the hip with pressure on the femoral vein, or tight, heavy abdominal dressings or binder should be avoided. "Use digitalis," says Speed, "and give the patient frequent change of position with systematic light exercises in bed". "If thrombosis in the leg veins appear"—he asks the question—"should the vein be ligated?" As far as statistics go, the results from thrombosis are not frequently fatal, but each case must be judged on its own merits. Active treatment in known massive embolism is too frequently futile. Venesection to relieve the right heart may help; hypodermics of rapid stimulants, such as camphor or ammonia, are indicated. The Trendelenburg operation for the removal of the embolus from one branch of the pulmonary artery is described. One successful case, following the operation on a moribund patient, is recorded. The procedure consists of making an incision over the second left rib, with a second incision perpendicular to it and at the inner end, starting just below the sternoclavicular joint. The second rib and its cartilage are cleared out of the way; the cartilage of the third rib is likewise removed and the pleura is widely opened; the pericardium is also incised. A rubber tube is passed around the ascending aorta and the pulmonary artery opened by an incision half an inch long. The clot is pulled out by means of a special curved forceps. One has only to visualize the extent of this operation in a patient already moribund to understand that it can scarcely be considered as a practical surgical procedure.

W. A. Lister,⁶ writing on the same subject, compares 195 cases of pulmonary embolism following operation, and 12 cases following fracture, taken from the records of the Pathological Institute of the London Hospital, with the surgical practice of the hospital, as represented by 4000 major operations taken at random from the surgical records. He concludes: (1) The comparison indicates

that there are two outstanding factors which predispose to post-operative embolism—namely, the age of the patient and an incision through the anterior abdominal wall. In addition, fracture of the femur carries a high rate of incidence for this complication. (2) Free muscular action and well-balanced respiration, both costal and diaphragmatic, are the most important factors in maintaining efficient venous circulation. Free muscular action is conspicuous by its absence in the treatment of fracture of the femur, and it is suggested that inhibition of diaphragmatic respiration accounts for the comparatively high incidence of embolism after operations through the anterior abdominal wall. (3) Prophylactic measures should be directed towards the restoration of these two functions at the earliest possible moment after operation.

Sir Berkeley Moynihan,⁷ in an address entitled "Before and After Operation", states that "surgery has been made safe for the patient—we must now make the patient safe for surgery". "Surgical treatment", he says, "in many abdominal conditions, is speedier and safer than medical treatment, and capable of restoring the patient to a brighter degree of health and to a greater freedom for enjoyment; but it must be competent and careful surgical treatment, carried out by those who have trained themselves to secure the best results". He puts the direct transfusion of blood as amongst the most valuable procedures in selected surgical risks. Blood transfusion is used not infrequently in cases of inoperable malignant disease, when deep X-ray therapy is being applied, since a considerable reduction in the number of red cells is sometimes found to follow exposure to these powerful rays. Patients are encouraged to drink as much fluid as possible for a day or two before operation, and of all fluids he thinks a 5 per cent solution of glucose appears to be the best. He touches on the question of acidosis as a sequence to operation upon a dehydrated and starved patient, upon patients who have jaundice or hepatic insufficiency, or whose kidneys work inadequately. It is recommended to give the 5 or 10 per cent solution of glucose with or without bicarbonate of soda continuously, an apparatus being used which maintains a constant temperature. Insulin can be administered at the same time either intravenously with the glucose or hypodermically, under very careful restrictions.

Alkalosis.—Much more attention has been paid to the condition of acidosis than to alkalosis. Many patients with high intestinal obstruction may have a condition of alkalosis, and alkalis are contra-indicated. The condition may result either from excess of alkali or from a decrease in CO_2 . It occurs clinically, according to Moynihan, from an excessive overdosage with alkalis. This may occur in cases with poor renal function. Seven cases of alkalosis following the alkaline treatment of duodenal ulcer are mentioned. One patient, a male 50 years of age, who had suffered for a few months from excessive vomiting, died comatose. The blood-urea was almost quadrupled. This may have been a case of uræmia, but many similar cases of toxicity are reported. Alkalosis also occurs in cases of duodenal or gastric obstruction, where free HCl is diminished.

F. A. Bothe⁸ deals with this question of alkalosis. He states that the clinical, pathological, and blood chemistry changes are more or less generally understood, and the existence of a severe toxæmia has been recognized. He says that alkalosis should be thought of as a post-operative complication. It occurs also in a pre-operative group. The latter comprises for the most part cases of pyloric or duodenal obstruction, and those of peptic ulcer which have developed alkalosis under the alkaline régime. He draws attention to the coincident fall of blood chlorides and decrease of chlorides in the urine, together with the benefit derived by the intravenous injections of chlorides in cases of high obstruction. Vomiting is persistent; gastric lavage gives only temporary relief. In arriving at a diagnosis of alkalosis we cannot always depend upon

the clinical picture. Persistent vomiting, evidence of marked dehydration, diminished urinary output, the presence of uræmia or tetanoid tendencies, are the findings which would establish the diagnosis clinically. The changes in the blood chemistry are always more constant; essentially, there is a fall in the blood chlorides followed by a rise in the blood nitrogen and the CO_2 -combining power of the blood-plasma. In treatment, repeated **Gastric Lavage** should be given to relieve the stasis, and **Normal Saline** and 10 per cent **Glucose** to combat the depletion of chlorides and the renal insufficiency. If alkalosis persists as a post-operative complication, and the remedies suggested are insufficient, **Jejunostomy** is indicated. If tetany develops, **Calcium** is administered intravenously in 5-c.c. doses of a 10 per cent solution of calcium chloride. Alkalis are contra-indicated—this is mentioned because of the wide use of sodium bicarbonate in cases of persistent vomiting.

Preparation of the Skin for Operation.—There are many different methods in use for the preparation of the skin. Soap and water immediately before operation has been practically eliminated; anything that softens or macerates the surface layers may establish and not diminish infection. On the other hand, preparations which harden and dry the skin have for obvious reasons proved effective. Whatever the preparation, it should be assumed that the skin does not remain sterile for long, and should be covered completely during operation by sterilized towels fixed to the edges of the wound. Alcohol penetrates the cutis to a considerable degree; it fills the hair follicles, but only slightly penetrates the sweat glands on account of the pressure of the secretion. The main action of alcohol depends on its quality of fixing the superficial layers of the epidermis. Kocher believed that a 70 per cent alcohol solution supplied the most effective action.

Moynihan⁹ asks the question: "What are the requirements for an ideal disinfectant?" It should be cheap and easily accessible, simple in its application, non-irritant, capable of penetrating the skin to some depth; it should be effective in destroying in a short time all the organisms which are found on or in the skin, and it should do nothing to prevent or delay the clean and speedy healing of the wound. He thinks that tincture of iodine both experimentally and clinically is clearly of the second rate. With this statement the reviewer thoroughly agrees. Much experimental work has tended to prove that even when iodine is allowed to remain on the skin which is tested, sterilization is not always indicated by the culture-tube. If the iodine is removed by a solution of potassium iodide and the skin washed with sterile water and examined, infection is shown in over 50 per cent of the cases. There is nothing then to recommend iodine but the ease and rapidity with which it can be applied, and in addition it is a powerful irritant. "Picric acid in alcohol solution", says Moynihan, "of a 3 or 5 per cent strength, gives better results than iodine, but it does not penetrate deeply and it is not of sufficient bactericidal value". Moynihan recommends: (1) Abundant washing with soap and water, preferably ether soap; (2) Gently friction with biniodide of mercury and spirit solution, 1-500; (3) Drying, followed by the application for two to three minutes of Harrington's solution. The reviewer uses this method in every case, but soap and water is not employed immediately prior to operation. Thorough washing and shaving is carried out the night before.

Various dyes, such as brilliant-green, have been employed in the disinfection of the skin, but have not been proved to possess any special advantage over the methods already mentioned. The reviewer has never seen these dyes used for skin preparation in any of the large hospitals at home or abroad.

Post-operative Hæmolytic Streptococcus Infections.—In one case, after a simple operation for appendicitis by the reviewer the patient became severely

infected with hæmolytic streptococcus. The wound was re-opened and drained; there was considerable sloughing of the tissues; the testicle completely sloughed away; and after a period of anxiety the patient recovered. In a second case,¹⁰ he was called to see a lady with an acute abdomen. At operation, the peritoneal cavity was full of pus; no perforations or other lesion whatsoever could be found. A culture was made of the pus, and the hæmolytic streptococcus was found in pure culture. The patient died forty-eight hours after the onset of abdominal pain. Her age was 37. A few days before the acute abdominal symptoms developed, she had suffered from a sore throat, and septic spots had appeared on some ragged tonsillar stumps.

F. L. Meleney¹¹ describes the seasonal incidence of hæmolytic streptococcus in the nose and throat. He demonstrated that a culture taken from infected wounds yielded a hæmolytic streptococcus identical with an organism obtained from a culture taken from the nose of one of the nurses who assisted at the operation. Cultures from the throats of all the members of the operating team at that time revealed the surprising fact that 33 per cent of these persons harboured hæmolytic streptococci in their throats. A strict masking was found to prevent the expulsion of organisms from the nose and mouth. The results of Meleney's study are of value in demonstrating, in the nose and throat of the operating personnel, a potential source of severe wound infections. The danger varied from time to time, but in general was greatest in the late winter and spring months. Post-operative wound infections in clean cases may be produced by organisms expelled from the nose or mouth of operators, nurses, or visitors. All persons who may in any way come in proximity to the sterile field during an operation should mask very carefully both the nose and the mouth.

REFERENCES.—¹*Brit. Med. Jour.* 1927, ii, 283; ²*Surg. Gynecol. and Obst.* 1926, Aug., 224; ³*Brit. Med. Jour.* 1927, i, 1001; ⁴*Ibid.* 1923, ii, 792; ⁵*Ann. of Surg.* 1927, Jan., 44; ⁶*Lancet*, 1927, i, 111; ⁷*Ibid.* 1926, ii, 789; ⁸*Ann. of Surg.* 1926, Oct., 465; ⁹*Abdominal Operations*, 4th ed.; ¹⁰*Med. Press and Circ.* 1927, May 4, 358; ¹¹*Jour. Amer. Med. Assoc.* 1927, April 30, 1392.

PREGNANCY. (See also ANTE-NATAL CARE; CONTRACTED PELVIS.)

Beckwith Whitehouse, M.S., F.R.C.S.

Accidental Hæmorrhage.—F. J. Browne¹ records the results of an experimental investigation into the *etiology* of accidental hæmorrhage and placental infarction. Using the method of Shaw Dunn,² he first produced either acute or chronic nephritis in rabbits by the injection into the ear vein of a 1 per cent solution of sodium oxalate. Blood-urea was estimated at varying intervals and taken as the clinical index of the onset and duration of the nephritis. In pregnant animals with artificially produced nephritis, Browne was able to effect the production of accidental hæmorrhage by intravenous injection of various organisms. The method was successful in 100 per cent of the experimental cases in which a chronic oxalate nephritis was present and exacerbated by the introduction of organisms with more oxalate. The hæmorrhage was both external and concealed, and associated with placental infarction. Hæmorrhage can be produced, though less easily, by setting up an acute nephritis only, and then introducing organisms. It can also be obtained, but with less certainty, by producing a nephritis only, without the subsequent introduction of organisms. In every case in which hæmorrhage was caused, Browne found that it was preceded by an acute or subacute exacerbation of the nephritis. Apparently the coliform group of organisms are the most potent in producing the renal trauma that predisposes to hæmorrhage and placental infarction. The importance of this work lies in the fact that it shows the relation that acute or chronic nephritis bears to accidental hæmorrhage. It is believed the organisms only act by setting up an acute phase of the nephritis, and that

they do not lead directly to the uterine hæmorrhage. The latter is apparently caused by poisons held up in the circulation by the acutely damaged kidney.

The clinical condition of the uterine wall in concealed accidental hæmorrhage is the subject of a short paper by J. Hewitt.³ The writer is of opinion that the uterine wall in this condition is incapable of rhythmic contraction because it is already in a state of maintained and painful tetanic contraction. This opinion is based both on palpation and direct inspection of the uterus, and it is pointed out that the condition of the uterus has no direct relationship to the amount of blood contained within its cavity. Fitzgibbon has also stated his belief that the uterus is in a tonic condition, and attributes its apparent increase in size not so much to distention with blood as to forward projection produced by this state.

REFERENCES.—¹*Edin. Med. Jour.* 1926, Oct., 151; ²*Jour. of Pathol. and Bacteriol.* 1924, xxvii, 209, 377; ³*Edin. Med. Jour.* 1926, Nov., 169.

PROCTITIS, ULCERATIVE.

J. P. Lockhart-Mummery, F.R.C.S.

This condition is usually, although not always, part of a general ulcerative colitis. It may occur as sequelæ to some specific form of ulceration, such as dysentery or gonorrhœal proctitis, but in the majority of cases appears to arise insidiously. It is certainly an infective process, and very many attempts have been made to isolate some organism which was thought to be the controlling infective agent. Thus, Gemmel believed that the *B. dysenteriæ* of Flexner was the causal agent. Barjer isolated a diplococcus which produced similar lesions when injected into rabbits, but the disease thus produced showed wide differences from the ordinary type of ulcerative colitis. All attempts to discover a single infective agent have hitherto proved fruitless. Bacteriological examinations of the stools from cases of ulcerative colitis show very many organisms, most of which are certainly due to secondary infection. One of the organisms which is more or less constantly present, and which there can be no doubt is largely responsible for the very grave character of the disease, is a streptococcus, generally the *Str. hæmolyticus*. This organism is almost constantly present in severe and chronic cases, and is the cause of the more serious symptoms and complications, but whether it is a primary or secondary infection is not yet known. It seems probable that the primary infective agent is some form of protozoön in most cases, and that the streptococcal infection is secondary.

In a few cases the method of infection and the infective agent can be traced. As already mentioned, cases of *amæbic dysentery* sometimes terminate as ulcerative colitis. In the early stages these cases are typical amæbic dysentery, while in the late stages no amæbæ or cysts are present and the chief infective agent appears to be a streptococcus. Again, during the war there were quite a number of cases of *sand diarrhœa* in Egypt and Gallipoli, which became secondarily infected, and, when examined many months later in this country, were suffering from chronic ulcerative colitis with streptococci in the stools. A few cases have also been recorded of ulcerative colitis due to infection with the pneumococcus, almost pure cultures of the *Diplococcus pneumoniae* being found in the stools from such cases.

The treatment of ulcerative proctitis and colitis has been attempted upon several lines with varying success. The three chief principles have been: (1) To increase the patient's resistance to the infection by general hygiene, suitable feeding, etc., aided by vaccines or antisera. Vaccines have hitherto proved of little use, but good results have been obtained in a few cases with antidyenteric serum. A. F. Hurst¹ speaks very highly of the results of intravenous injections of polyvalent Antidyenteric Serum in large doses. He

admits, however, that it completely fails in some cases. He also states that "there is not yet sufficient evidence that the vaccine exerts any definite influence on the disease". (2) By substitution of a harmless organism for the infective one, on the same lines that the Bulgarian lactic acid bacillus can be substituted for the *Bacillus coli*, as pointed out by Metchnikoff. Attempts of this nature have been tried for some time at St. Mark's Hospital with various organisms, and the patients have been given suitable foods to encourage the growth of the substituting organism. So far it cannot be said that this method has given very good results, though it seems decidedly promising. (3) Mechanical washing out of the colon with salt solution through an Appendicostomy opening. Up to date this last method has given by far the best results, and has generally been successful when instituted at an early stage in the disease. The failures have nearly all been due to the patient's resistance being too much reduced before treatment was started. The appendicostomy opening is established under local anæsthesia in bad cases, and the operation should not in any way be contra-indicated by the patient's condition. Eventually one of the first two methods, or a combination of them, will probably prove successful, but there are great difficulties, due chiefly to the very varying nature of the infective agent, which have yet to be overcome.

With appendicostomy the colon and rectum are washed out twice daily or oftener until all the ulcers have healed, as seen by a sigmoidoscopic examination. These examinations should be used to check all treatment in this condition, as it is the only safe guide to the progress of the disease. After the ulceration has healed the washing-out can be discontinued, but the opening should not be allowed to close for a year at least, as recurrences are very common. Colostomy and cæcostomy have been recommended for ulcerative colitis, but should not be done, as serious cicatrization of the colon is then liable to occur and render closure of the opening impossible after the disease has subsided.

Except where colostomy has been performed, *stricture* is not a common complication of ulcerative colitis, but it does occasionally occur. Hurst records 2 cases out of his series of 19 cases. Stricture is a very common result of chronic ulcerative proctitis if treatment is neglected. Some twenty years ago there was little if any efficient treatment of ulcerative proctitis, chiefly because there was then no means of seeing and diagnosing the condition. In these days, with the sigmoidoscope and electric proctoscope it is quite easy to see the condition, and with suitable treatment, by washing out the bowel regularly with silver solution or the direct application of silver nitrate to the ulcers, healing can be secured, and serious stricture is much less common.

REFERENCE.—*Lancet*, 1926, ii, 1151

PROLAPSE, GENITAL.

Beckwith Whitehouse, M.S., F.R.C.S.

Discussing the prophylactic treatment of prolapse, John S. Fairbairn¹ observes that the problem is essentially one involving the child-bearing woman. Congenital mal-development or weakness of the supporting tissues accounts for the small percentage (less than 5) of cases which occur in nulliparæ. After referring to the danger of forceps extraction before complete dilatation of the cervix, and the hardly less important factor of defective involution and inflammatory fibrosis of the supporting structures, the writer calls attention to the importance of careful and immediate repair of all lacerations of the genital tract. With a strict technique, infection is prevented and a step taken to obviate the incidence of that weakness of the pelvic floor which accompanies prolapse. Whilst the untimely application of high forceps is a fertile cause of uterine descent, a timely use of low forceps is a procedure to be advocated. As Fairbairn observes, there is a considerable weight of evidence to show that the prolonged

stretching by the foetal head delayed on the perineum may weaken the muscles at the outlet more than a low forceps operation.

Much can be done to prevent minor degrees of prolapse by the adoption of suitable Exercises during the puerperium. The author lays stress on the value of breathing exercises for the abdominal muscles whilst in bed, and especially of contractions of the levator ani. A particularly good exercise is that of contraction of the levator ani with the patient on her back, the knees drawn up, the feet flat on the bed, and the pelvis raised in order to take the weight of the abdominal viscera off the pelvic floor. While 'squeezing up' she is told to bring the knees together, the nurse resisting this movement by holding the knees apart. If any complications are present to contra-indicate the adoption of these bed gymnastics, general massage may be substituted until the patient can commence active muscular movements. Fairbairn considers that the abdominal binder should be reserved for special cases only, and at the most for a day or two after labour only. A binder merely 'splints the abdominal muscles' and lessens their physiological activity. If the uterus is found to be retroverted at the end of the puerperium it should be replaced, and a ring pessary may be worn without harm for a period of not longer than three months.

Frank Lynch² also lays stress on the importance of prophylaxis of cystocele and rectocele by preventing deep vaginal tears during labour. This writer also refers to the value of post-natal care, and the importance of treating cystocele and rectocele by surgery whilst the lesion, although sufficient to demand treatment, is fairly simple. As large hernias of this type in young women are difficult to cure without narrowing the vagina, Lynch observes that the wise course is to cure the process whilst it is in the earlier stages, unless the lesion can be controlled by pessary treatment until the patient has passed the child-bearing period.

James Masson³ describes the technique of the Mayo operation for cystocele. The writer observes that the operation is especially indicated for patients close to or past the menopause if the cystocele is large. The operation is not likely to receive much support from surgeons in Great Britain, since the technique involves a hysterectomy by the vaginal route and suture of the divided broad ligaments. The operation appears to the reviewer to be an elaborate and correspondingly dangerous method of treatment for a condition which can be adequately and safely cured by less drastic measures. [The shade of Fothergill presides over the pen of the reviewer as he writes these words!—B. W.]

REFERENCES.—¹*Lancet*, 1926, II, 1076; ²*California and West. Med.* 1926, Oct., 477; ³*Surg. Gynecol. and Obst.* 1926, Oct., 505.

PROSTATE, SURGERY OF.

Sir John Thomson-Walker, F.R.C.S.

An investigation carried out on over 150 patients at the London Hospital, for the purpose of determining the comparative value of renal efficiency tests in patients with enlarged prostates, leads J. Marrack and S. Robinson¹ to state that they "consider that this series of cases illustrates the value of blood-urea estimation; the urea concentration test is of some value to supplement the blood-urea, probably most particularly in those cases in which the blood-urea has fallen after treatment; satisfactory conclusions can only be drawn from the phenolsulphonaphthalein test when the results are high—such a result can be taken as certain evidence of sound kidneys—but the test is disappointing owing to the frequent occurrence of low results when the kidneys appear to be sound." [This conclusion comes as a surprise, for, dealing with large numbers of cases over a long period, the reviewer has come to regard the urea concentration test as more reliable than the blood-urea estimation and as being

a necessary check on the results of the latter test. In this article, as in many others, survival from the operation without regard to the cause of death is taken as an indication of the accuracy of the renal function tests. A patient who dies of post-operative hæmorrhage or of pyelonephritis following operation may have a normal renal function at the time of the test; yet these cases are taken as proof of the unreliability of the urea concentration test. If only such cases as definitely succumb from renal failure are considered, it will be found that the urea concentration test is superior to any of the others in clinical work.—J. T.-W.]

The *pre-operative and post-operative treatment of cases of 'benign prostatic hypertrophy' submitted to suprapubic prostatectomy* are discussed by V. C. Hunt.² The important factor in the pre-operative treatment is preliminary drainage of the bladder. In the small percentage of cases in which urethral catheterization cannot be carried out, suprapubic cystotomy will be necessary. In any case, however, whether drainage is by urethral or suprapubic catheter, the benefits of preliminary treatment are best attained if the drainage is continuous. Intermittent catheterization is not as effective and may be dangerous. The writer states that some difference of opinion exists regarding the advisability or otherwise of post-operative irrigation of the bladder, and in his opinion it contributes little to the welfare of the patient and may do harm by precipitating secondary bleeding. The daily instillation of a 1 per cent solution of mercurochrome is stated to possess some merit. The author advocates sacral anæsthesia, which he states possesses none of the disadvantages of general anæsthesia and is devoid of the dangers of spinal anæsthesia. In skilled hands he finds that it rarely requires to be combined with any other method. For hæmostasis an interrupted suture at the vesical neck is combined with a Pilcher's bag. Excessive distention of the bag may injure the sphincter and may cause bleeding by stretching the capsule. The bag is held in place by traction exerted by attaching the catheter to a metal tripod. The bag is retained for six to twelve hours. There is little reliable evidence to support the contention that the use of the urethral catheter before and after operation contributes to the incidence of epididymitis.

In an address on '*Failures of Prostatectomy*' delivered before the Manchester Surgical Society, Thomson-Walker³ included under this category patients left with persistent suprapubic fistulæ, chronic infection of the previously uninfected urinary tract, and post-operative obstruction at the site of the prostatic cavity. The causes of these failures may be reduced to two fundamental factors, namely, sepsis and obstruction, and the writer considers in detail how these failures come about and how they may be prevented or remedied. The author advocates an open operation with careful removal of flaps and nodules and hæmostasis, while the rectal finger is completely abandoned. A recent series of 156 consecutive private cases is analysed, in which the average age of the patients operated upon was 67·2 years and the mortality was 4·4 per cent. Of the 7 cases that died, the causes of death were pulmonary embolism, 3 cases; acidosis, 1; cerebral hæmorrhage four weeks after operation, 1; diabetic coma, 1; cerebral degeneration and circulatory failure thirty-two days after operation, 1.

The writer noted the dates of the first spontaneous micturition and of the closure of the suprapubic wound after operation in regard to 200 private cases in which the method of operation and the after-treatment was uniform. In all these cases, a catheter was tied in the urethra with the eye in the prostatic cavity at the time of the operation and was retained for seven days. A Hamilton-Irving box was applied soon after the operation, and daily or constant continuous irrigation was made through the catheter. The tubes were removed

on the fourth day, and the catheter on the seventh day. The Hamilton-Irving box was used until the wound was dry. The cases were consecutive, with the exception of 3 unusually complicated cases. The results for three years are as follows: 1924, average day on which urine was first passed, 13.1; average day on which wound became dry, 16.7. Corresponding figures for 1925 were 12.1 and 16.4, and for 1926, 10.1 and 16.0. In 1926, but for two long cases, the average time for healing of the wound would have been shorter still.

J. H. Morrissey⁴ states that *incontinence of urine* has been a source of great complaint after perineal prostatectomy, and that this has been a sufficient reason for discarding the perineal route for the suprapubic, on the part of many surgeons. Usually, the incontinence does not occur immediately after the operation. It varies much in degree, from dribbling, extreme urgency, lack of control separate from anal control, to complete incontinence. The last state is seldom met with, but the other forms are often seen. In order to avoid this sequela, the writer has modified the technique of perineal prostatectomy so as to leave both the internal and external vesical sphincters intact, and so far, in 84 cases, his results have been very satisfactory as regards permanent and satisfactory control of micturition. A special prostatic tractor with a prostatic curve on it, which opens when in the bladder by means of a mechanism in the handle, is inserted along the urethra, and the use of this instrument avoids opening the membranous urethra in order to obtain traction. The capsule is incised vertically over the centre of each lobe of the prostate, each incision being placed at a safe distance from the prostatic urethra. Enucleation of each prostatic lobe is carried out, if possible, without tearing the prostatic urethra.

F. Hinman⁵ describes a *modification of the operation of perineal prostatectomy* which differs from the classical operation mainly in that the writer, after defining the interval between the prostate and rectum, follows this plane of separation with the finger well to the side of the mid-line. The surface of the prostate is exposed well to one side or the other, usually the right side of the patient, as this is the more convenient for the operator. The fascia of Denonvilliers is recognized by its smooth glistening surface after blunt dissection in the above plane of separation. By traction upon an intra-urethral prostatic tractor the surface of the prostate is well exposed, and an inverted V-shaped incision is made on its posterior aspect with the apex just above the position of the verumontanum. The resulting V-shaped flap is drawn down, exposing the prostatic urethra with the glandular enlargement surrounding it. The latter is now enucleated *en masse* under direct vision and with preservation of the internal sphincter of the bladder.

M. Stern⁶ describes an *instrument whereby portions of tissue can be removed from the neck of the bladder by means of the high-frequency current*, in a water medium and under direct cystoscopic vision. The writer is of opinion that it is possible with this apparatus to produce marked improvement as to symptoms in a large number of cases of hypertrophy of the prostate, and states that "with the evidence at hand, it is not too much to assume that permanent results can thus be obtained". For the so-called bars and contractures about the neck of the bladder Stern considers that nothing more radical can be justified, and for cases of obstructive carcinoma of the prostate he regards this form of resection as a more logical proceeding than suprapubic cystotomy.

A few modifications of technique in the *post-operative treatment of suprapubic prostatectomy* are reviewed. Thus, H. B. Devine⁷ describes a modification of the method of draining the bladder after suprapubic prostatectomy by means of aspiration with a Sprengel's pump. T. M. Millar⁸ describes a method of retaining in position the Hagner-Pilcher bag used for the control of hæmorrhage from the prostatic cavity after prostatectomy, which consists in exerting

traction on the urethral prolongation of the bag by means of weight-extension, which is brought over the bar at the foot of the bed. R. O. Ward⁹ has devised a clamp whereby a slightly modified form of the Hagner-Pilcher hæmostatic bag can be retained in position in the prostatic cavity. The clamp provides a fixed support above, together with adjustable counter-pressure on the perineal surface below. Several diagrams explain the apparatus and its method of application.

H. L. Kretschmer¹⁰ analyses a series of 76 cases of *prostatic calculus* occurring in patients between the ages of 21 and 76 years. The largest number was found in the fifth decade—24. A history of antecedent gonorrhœal urethritis was obtained in 33 cases; 11 gave a history of urethral stricture, and 5 one of epididymitis. Calculi were associated with carcinoma of the prostate in 5 of the cases. In several cases a diagnosis had to be made as between calculi and calcification due to tuberculosis in the prostate. All cases of chronic prostatitis that have been under treatment for a long time and that still show signs of pus in the prostate should be X-rayed for evidence of prostatic calculus.

Carcinoma of the Prostate.—A careful review of the diagnosis and treatment of 1000 cases seen at the Mayo Clinic is made by H. C. Bumpus, junr.¹¹ In 495 cases the disease occurred between the ages of sixty and seventy years; in no case was it met with before the forty-second year, and in only 4 cases did it occur prior to the forty-fifth year. Frequency and difficulty of micturition were initial symptoms in 650 cases, pain in 156. The pain was due to metastasis, and was most common in the back and thighs. Retention, a common first symptom in cases of benign hypertrophy, was found as an initial symptom only 37 times, whereas hæmaturia as a first symptom was not noted at all. In 485 cases, in which no treatment was given, the average duration of the disease from the appearance of the first symptoms until death occurred was 31 months. Two-thirds of the patients in whom evidence of metastasis was found at the time of examination died within nine months. A few patients live for many years; thus 4 lived more than three years, and 2 more than ten. In 243 of the cases, metastases were demonstrable, and in 44 per cent these involved the lymph-glands about the internal and external iliac arteries and about the promontory. In 25 cases, metastasis was evident in the cervical and supra-clavicular lymph glands. The inguinal lymph glands were involved in 44 cases, but these and the axillary lymph glands are usually affected late in the disease, and their involvement is therefore of little help in diagnosis.

Metastases in bone appear later than those in the lymphatic system, and are usually of the osteoplastic type and easily detected by means of the X ray. They tend to occur earliest in the sacrum and adjacent portions of the spine and pelvis. Of 539 cases submitted to X-ray examination, the pelvis was involved in 123 and the spine in 107 (25 per cent). The femur was affected 16 times and the ribs 10, but always in conjunction with pelvic involvement. Early metastatic lesions are difficult to distinguish from areas of osteitis, and when the latter are found in the sacro-iliac region in men of prostatic age, rectal examination is called for. Paget's disease of bone must be carefully excluded, and X-ray examination of the skull should be made. In 12 out of 246 cases in which the lungs were X-rayed, metastatic deposits were found, and in all of these metastasis was already present in the spine or pelvis. Eleven patients had metastases in the spinal cord which led to symptoms simulating primary tumour of the cord. Several of these had no urinary symptoms, pain and paralysis being the initial and sole complaint. At times the disease in the lymph glands causes pressure on the spinal nerve-roots, giving rise to girdle pains and 'sciatica' or 'rheumatism'. The possibility of such pain being a sequence of malignant disease of the prostate in elderly men must not be

forgotten, for, in the series under review, pain was the third most frequent initial symptom, occurring in 15 per cent of the cases.

There were 164 completed recorded cases of prostatectomy—47 by the perineal route and 117 by the suprapubic. The length of life following operation averaged thirty months for the group, and only 21 survived for five years. In many of these cases the malignant disease was discovered only at operation after the gland had been removed for what was thought to be benign hypertrophy. The results were therefore poor, and should make one hesitate to recommend removal of the prostate when the disease has advanced sufficiently to allow of positive diagnosis. Radium emanations given in the rectum directly over the prostate were early abandoned, for, of the 35 cases so treated, all but 1 are dead and many of them suffered severely from proctitis as a result of the treatment. Treatment by the introduction of radium-bearing needles passed directly into the growth through the perineum was carried out in 35 cases, only 3 of whom are alive. The average length of life for this group was only sixteen months after the application of radium. Of the 122 patients treated by the application of radium by the insertion of emanation-bearing seeds directly into the gland through the urethra, through the perineum, and over the rectal surface, there are completed records of 112. The dosage given averaged about 2000 mgrm.-hours and the patients lived, on an average, twenty-two months following this treatment. Of these, 25 are still living, 9 more than three years, 4 of whom have lived more than five years. The results given by performing prostatectomy after radium emanations were so poor that this proceeding was quickly abandoned. The writer is of opinion that the best use to which radium can be put in these cases is by the thorough irradiation of the prostatic capsule and seminal vesicles after removal of a prostate which shows but little malignant involvement, for in this way the lymphatic vessels are blocked and metastasis to the iliac lymph glands may be prevented if it has not already occurred. Permanent suprapubic cystostomy was performed in 125 cases, of which there were complete records in 117. This operation was only performed after urethral catheterization had become difficult or impossible. In these patients the average duration of the disease was fifty-seven months, and after operation they lived an average of twenty-four months, more than twice as long as the patients for whom cystostomy was not performed. There are 34 still alive, 11 more than three years since their operation, of whom 6 have lived more than five years. No form of treatment has proved so free from risk, has caused so little suffering, and has lengthened life as much as suprapubic cystostomy.

REFERENCES.—¹*Lancet*, 1926, ii, 369; ²*Surg. Gynecol. and Obst.* 1926, Dec., 769; ³*Lancet*, 1927, i, 1010; ⁴*Surg. Gynecol. and Obst.* 1927, May, 671; ⁵*California and West. Med.* 1926, Aug., 201; ⁶*Jour. Amer. Med. Assoc.* 1926, Nov. 20, 1726; ⁷*Surg. Gynecol. and Obst.* 1926, Aug., 219; ⁸*Brit. Jour. of Surg.* 1926, xiv, July, 83; ⁹*Brit. Med. Jour.* 1927, i, 370; ¹⁰*Surg. Gynecol. and Obst.* 1927, Feb., 163; ¹¹*Ibid.* 1926, Aug., 150.

PRURITUS ANI ET VULVÆ. A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

A. Castellani¹ lays stress on the frequency with which pruritus ani et vulvæ is due to mycotic infection. The fungus usually responsible is one of the epidermophyton group, such as is found in tinea interdigitalis or tinea cruris (dhobie itch). The author points out that little may be seen except the secondary changes due to scratching, and that only by repeated scraping can the fungus be found. In some cases monilia and other yeast-like organisms, either alone or together with the epidermophyton, have been found, but he thinks they are probably secondary invaders. The same applies to bacteria found in the same situation. Diagnosis can only be made with certainty by microscopic examination, but the presence of minute, red, infiltrated patches in the ano-perianal

region is suggestive, especially if the patient is suffering from mycotic dermatitis of the toes, or gives a history of having had tinea cruris in the past. He recommends, in uncomplicated cases, the application of the following ointment :—

R	Sulph. Præcip.		Vaselin.	ad 3j
	Acid. Salicyl.	āā gr. xxx		

As an alternative Deek's ointment often answers well :—

R	Acid. Salicyl.	pt. 4	Ol. Eucalypt.	pt. 4
	Bismuth. Subnit.	pt. 10	Vaselin.	
	Hydrarg. Salicyl.	pt. 4	Lanolin.	ad pt. 100

Other antimycotic remedies, such as **Whitfield's Ointment**, $\frac{1}{2}$ per cent **Chrysarobin**, dilute tincture of **Iodine**, lotion of **Potassium Permanganate** (3 per cent to 12 per cent), 1-1000 **Perchloride of Mercury** lotion, and **Resorcin** lotion (1 per cent to 5 per cent) are also recommended. In persistent cases 3 per cent **Silver Nitrate** in spt. æth. nit., or **X rays**, are advised.

E. L. Oliver² claims good results in the treatment of pruritus ani by **Ionization** with 1 per cent **Mercury Oxycyanide**. The method of application is that usually employed. Of 30 patients treated by this method, 7 stated they were cured, 10 much improved, 7 slightly improved, and 6 not improved.

H. E. Alderson³ recommends the use of **Carbon Tetrachloride** to which $\frac{1}{2}$ per cent phenol or 2 per cent camphor has been added as a useful application in this condition. Not only does it check itching, but cleans out the crypts and follicles about the anus. If the application is too drying, some lanolin can be dissolved in the carbon tetrachloride. After application a dusting powder of magnesium carbonate or talc may be applied. Alderson insists strongly, however, on a careful examination to discover the cause of the itching.

REFERENCES.—¹*Practitioner*, 1926, Dec., 341; ²*Arch. of Dermatol. and Syph.* 1926, Nov., 560; ³*California and West. Med.* 1927, Jan., 51.

PSEUDOHYPERTROPHIC MYOPATHY. (*See MYOPATHY, PSEUDOHYPERTROPHIC.*)

PUBLIC HEALTH (INFECTIOUS DISEASES) REGULATIONS, 1927. (*See INFECTIOUS DISEASES, PUBLIC HEALTH REGULATIONS.*)

PULMONARY FIBROSIS IN CHILDREN. (*See LUNG, CHRONIC NON-SPECIFIC INFECTION OF.*)

PULMONARY TUBERCULOSIS. (*See TUBERCULOSIS, PULMONARY.*)

PURPURA.

Ivor J. Davies, M.D.

H. Letheby Tidy,¹ in the Hunterian Oration of 1926, makes a contribution on the hæmorrhagic diathesis, and suggests the term 'angioslaxis' to include this group of hæmorrhagic affections. The following summary is abstracted : (1) The conditions due to the hæmorrhagic diathesis include the primary purpuras, cases recorded in the literature under such titles as 'chronic', 'recurrent', and 'hereditary' purpura, and as 'essential thrombopenia', some of the ill-defined blood diseases of childhood, and some of the forms of local hæmorrhages from the mucous membranes. The condition is usually sporadic, but may be hereditary or familial. (2) The initial defect is probably abnormal permeability of the endothelium of the small blood-vessels. (3) There is no essential difference between the various groups. The cases differ in degrees of severity and in the effects of secondary changes. (4) Changes in the total number and differential distribution of the blood-cells, in the number of platelets, in the condition of the bone-marrow, and in the size of the spleen, are

secondary phenomena. There are no constant or typical changes. (5) Reduction in the number of platelets in any condition is not necessarily followed by hæmorrhages, but is a factor in their occurrence and severity. Reduction may occur in any form of purpura and is not a criterion for the separation of a special type. (6) Splenectomy is beneficial without being a 'cure'. (7) The question of splenectomy should be considered in every case of the hæmorrhagic diathesis. The decision as to operation should be based essentially on the clinical condition of the patient in the present and in the past. The number of platelets, the size of the spleen, and the bleeding time are of subsidiary importance only. In acute forms and with advanced anæmia, blood transfusion should be performed first.

J. W. Sooy and T. S. Moise² communicate a preliminary report of the results of treatment of idiopathic purpura hæmorrhagica by exposure to the **Mercury-vapour Quartz Lamp**. The experimental work of Laurens and Sooy³ has demonstrated a definite increase of the blood-platelets after irradiation of white rats with the mercury-vapour quartz lamp, and offers a rational basis for the application of this method to the treatment of certain hæmorrhagic diseases associated with a platelet deficiency. Ten cases of the diseases were thus treated by Sooy and Moise with favourable results. In two instances the treatment was used as a method for the pre-operative preparation of patients in need of surgical attention: in one for the extraction of several teeth in a woman who had bled profusely for three days after a recent tooth extraction, and in a second patient with a markedly hæmorrhagic diathesis on whom a tonsillectomy was indicated. The procedures were followed by a normal convalescence free from bleeding.

REFERENCES.—¹*Lancet*, 1926, II, 365; ²*Jour. Amer. Med. Assoc.* 1926, July 10, 94; ³*Proc. Soc. Exptl. Biol. and Med.*, 1924, xx, Nov., 114.

PYLORUS, CONGENITAL HYPERTROPHIC STENOSIS OF.

John Fraser, Ch.M., F.R.C.S.Ed.

An excellent account of the present-day views on this disease is given by W. E. Ladd¹, the paper being based on a study of 197 cases in the Boston Children's Hospital. Attention is drawn to the work of Wolback and Dent, who demonstrated the congenital nature of the disturbance, a fact often overlooked in the literature of to-day. The clinical history and physical signs are studied in detail, but no new point emerges in this connection. The two conditions likely to be confused with congenital pyloric stenosis are duodenal atresia and simple pyloric spasm. The value of X-ray barium examination as a means of clearing up a doubtful diagnosis is discussed, but it is recorded that the method is now restricted to cases of peculiar difficulty. Strauss, on the other hand, is a firm believer in the value of this means of investigation, and upon its results he in some measure bases his choice of treatment. For example, "he defers operation if 80 per cent of a barium meal passes through the stomach in four hours, and resorts to operation only when not more than 30 per cent passes through in that time."

On the question of treatment Ladd is clear and definite. **Operation** is advised in those cases in which the diagnosis is fully established. In mild and borderline cases medical treatment should be pursued unless it is obvious that the infant is failing to improve. Attention is drawn to the supreme importance of careful *pre-operative treatment*; emergency operation is practically never permissible, for its results are infinitely worse than those of the cases in which a day or two is spent in preparation for the operative risks by such means as hypodermoclysis, rectal glucose salines, and transfusion. A record is given of the evolution of the operative procedures with its culmination

PLATE XXVIII

RADIODERMATITIS

(O'DONOVAN)



Fig. A.—Radial aspect.



Fig. B.—Palmar view.

*By kind permission of the
'British Journal of Dermatology and Syphilis'*

in the highly satisfactory operation of pylorotomy, and it is pointed out that, if questions of precedence are to be observed, the name of Fredet should be associated with the operation that to-day we call Rammstedt's.

A. C. Strachauer² records his results in 48 cases of congenital pyloric stenosis treated by operation. In 46 the Fredet-Rammstedt operation was performed, in 2 cases a gastro-enterostomy was done. The author urges the importance of careful preparation, and to this in large measure he ascribes the excellence of his results. He remarks: "These cases are never so emergent as to require immediate operation. Adequate pre-operative preparation is absolutely essential to success, and the more advanced and neglected the case, the more important becomes the need of this preparation."

This subject formed the basis of discussion at the Meeting of the Société Nationale de Chirurgie³ in March, 1927. André Martin reported his experience with twenty-one cases all submitted to operation, and the discussion centred round the question of the type of operation which should be practised. Certain French surgeons have been loth to abandon the operation of gastro-enterostomy, but the opinion in this discussion—Martin, Veau, Fredet, Mouchet, and others—was that pylorotomy was the ideal procedure.

C. K. J. Hamilton⁴ discusses the question of treatment, his conclusions and recommendations being those generally expressed. A valuable portion of his paper deals with medical treatment, and in this he summarizes the modern views on the most successful non-operative methods.

REFERENCES.—¹*Boston Med. and Surg. Jour.* 1927, Feb. 10, 211; ²*Ann. of Surg.* 1927, Jan., 67; ³*Bull. et Mém. Soc. nat. de Chir.* 1927, March 12, 324; ⁴*Lancet*, 1926, II, 510.

PYOSALPINX. (See PELVIC INFECTION.)

PYURIA IN CHILDREN.

John Fraser, Ch.M., F.R.C.S.Ed.

The surgical aspects of pyuria in children are considered by C. G. Mixter¹, who insists on the menace and the importance of persistent or recurrent pyuria in children. So often, as Mixter says, the condition is either overlooked or neglected until serious renal destruction has occurred, while an unjustified optimism prevails regarding the use of diuretics and antiseptics as means of treatment. The thesis of the paper is to urge the necessity for detailed investigation of any case which does not rapidly clear up under simple methods of treatment. Possibilities of focal infection are investigated, and, these having been explored, a cystoscopic examination with ureteral catheterization and pyelogram is carried out. The importance of stasis at one or more points of obstruction in the urinary canal is elaborated, and attention is drawn to the frequency with which these obstructions are encountered at the uretero-pelvic junction, the vesical insertion of the ureter, or in the deep urethra.

REFERENCE.—¹*Boston Med. and Surg. Jour.* 1926, Sept. 23, 615.

QUINSY. (See TONSILS, DISEASES OF.)

RADIODERMATITIS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

W. J. O'Donovan¹ records a most interesting and unusual case of radio-dermatitis, and one which must be a warning to those who have charge of clinics in which ringworm is treated by X rays. The patient, a woman of 28 years, had held the heads of three children in succession during such treatment, probably about 15 pastille doses in all. The result is shown in *Plate XXVIII*. The case is further interesting by reason of associated weakness and wasting of the hands, which the author attributes to a localized neuritis due to the X rays.

REFERENCE.—¹*Brit. Jour. Dermatol. and Syph.* 1927, April, 149.

RADIOTHERAPY. (*See also* RADIUM THERAPY.)*C. Thurstan Holland, Ch.M.*

Sir Humphry Rolleston¹ devoted a large part of the Mackenzie Davidson Lecture in 1927 to a consideration of the effects of radiation on patients, and the means of protecting persons exposed to radiation, especially the radiologists themselves. The importance of this subject at the present time is very obvious. Fortunately, the X-ray burning of patients is no longer a danger, and can only result from want of expert knowledge or from want of skill. Probably it is not realized that at least one hundred workers have been killed by either X rays or radium, the majority of these by X rays, and that a very much greater number have been permanently damaged. An intimate knowledge of cause and effect resulted in the formation in England of a committee on protection, of which Sir Humphry is the president. This committee has just issued a revised report embodying its suggestions, and although it is possible the recommended protection may be considered by some as being unnecessary, at any rate if there is any error it is on the right side—that of safety. All radiologists and all hospital authorities responsible for X-ray and radium departments should be well acquainted with this report.²

Graves' Disease.—The results of the treatment of this condition by X rays are set forth by A. E. Barclay and F. M. Fellows,³ who have analysed 300 private cases. The authors describe the technique used, analyse the symptoms, refer to the risks, and discuss the results obtained. Tables are added which show that from 60 to 70 per cent of their patients were restored to a useful life, and another 20 to 30 per cent greatly benefited. It is pointed out that a considerable number of the cases had no X-ray treatment until a fully developed stage of the disease had been reached and the heart seriously damaged. The statement is made that the results are permanent, and the opinion is formed that the treatment is at least as good as surgery.

M. R. J. Heyes⁴ reviews the value of radiotherapy in the treatment of this disease, and bases his conclusions upon the results obtained in 100 cases of private patients. He draws a distinction between the results in hospital and in private cases, and points out that the results in the latter should for obvious reasons be the better. He does not consider cases as cured unless the pulse-rate has become normal, tremor and nutritional disturbances have disappeared, and the patients are able to follow their regular occupations. From his 100 cases, 62 are classified as cured, 14 as improved, 16 abandoned treatment, and results in 8 are unknown. All the cases which persevered in the treatment were cured, and in 64 per cent of the cases included the disease had existed for a year or more before X-ray treatment was begun. His paper discusses, amongst other things the method of treatment, the after-effects, a comparison with other methods of treatment, and the mode of action of X rays.

At the meeting of the British Medical Association at Edinburgh, in 1927, a discussion took place on the question of the surgical treatment of exophthalmic goitre. It was opened by T. P. Dunhill,⁵ who based his remarks upon some 240 operations which he had performed during the past few years.

I spoke from the point of view of X-ray (or radium) therapy, and pointed out that I considered it a tragedy of medicine that any one surgeon could report such a record—a tragedy not that he had found it necessary to operate on so many cases, but that so many cases had been allowed to reach that stage when operation came to be a justifiable procedure. I ventured the opinion that even in these advanced cases radiotherapy in skilled hands was capable of procuring results equal to those obtained by operation, and that, in contra-distinction to operation, there was no mortality due to the treatment. There can be no doubt that, in the most advanced stages of this disease, in

cases which had even passed the stage when operation was possible, a cure could be brought about by X-ray treatment. I suggested that radiologists did not want these advanced cases any more than, possibly, the surgeon wanted them; that the teachers of medicine were largely responsible for the fact that cases reached this condition, inasmuch as the hospital student was not taught to recognize the early symptoms and their importance. If a student was asked an examination question on this disease, he was expected to describe a case in its advanced stage, with tachycardia, palpitation attacks, involved heart, enlarged gland, marked exophthalmos, bad nervous symptoms—that is to say, a case in which all the tissues were, so to speak, water-logged with, and affected by, over-secretion. The real time for action was when the early symptoms manifested themselves, and these cases, owing to this method of teaching, were unrecognized. Valuable time was lost. The cases should be diagnosed early, treated as being serious from the start, and immediately treated by radiation therapy in addition to the other somewhat ineffectual medical routine. If X rays can bring about such good results in the late and severe cases, then they can arrest the disease in its early stages, and we should see few, if any, of those severe cases which eventually present the problem of X rays *v.* surgery.

One surgeon, differing entirely from others, said that he had never seen fibrosis produced by X-ray treatment, or the operation which was afterwards performed made more difficult on this account; neither had he seen any good result from X-ray treatment. The only possible reply to a statement of this kind is that his cases must have received inefficient treatment. It is a matter of common knowledge that many surgeons have found this fibrosis, and complained that it made the operation much more difficult; and too many good results have followed upon X-ray treatment properly carried out to warrant an opinion that it was of no use. A radiologist said that he preferred treating the late cases to the early ones, and that he considered it necessary to produce skin effects (telangiectasis, etc.) in some cases in order to bring about a cure. This is a most unfortunate and illogical attitude to adopt in view of the fact that practically all other radiologists agree that it is entirely unnecessary to produce any skin effects, and that results equally favourable can be obtained without doing this.

[To sum up: Diagnosis should be early and X-ray treatment should start at once. If this were the routine, neither surgeons nor radiologists would be brought into conflict over these desparately bad cases which neither of them particularly want to see, and the question of surgery in exophthalmic goitre would cease to be.—C. T. H.]

Carcinoma of the Breast.—N. S. Finzi⁶ discusses the results of irradiation treatment in this disease. This paper covers considerable ground, and is based upon cases which he has treated by massive doses of the hardest X rays; he considers that his best results have been obtained, as far as X rays are concerned, with the hardest rays. He compares the action and application of radium gamma rays and X rays, and discusses treatment by irradiation alone, whether of primary growths or recurrences, as well as radiation combined with surgery. The paper is illustrated by a series of radiographs which show the damage which can be done to the lungs by the deep X-ray treatment of these cases; but with improvements in technique this danger has been eliminated.

The author's results do not seem to differ materially from those which radiologists generally have reported. A note of pessimism is struck by the first sentence of his summing up when he states that "on the whole the material with which we have to deal is so bad that our results cannot be good". One speaker—Dr. R. E. Roberts—in discussing the paper, went even further in

stating that "the treatment of malignant disease was one of the most depressing occupations anyone could undertake; that it might be hoped that life was lengthened, but that it was often a question whether it was not rather a case of prolonging death". [I suggest that this is not the correct attitude to adopt, and that the case should be viewed from another and more optimistic standpoint. It is useless to lump all these cases together from the point of view of treatment; each individual patient has to be considered, and we should view the results of our treatment from the individual case and from what we can do for the individual. Apart altogether from the direct action of irradiation in prophylaxis—which naturally in not very convincing from the patient's point of view—we have all seen, in patients frightened almost to death, growths diminish or even disappear, secondary nodules vanish, ulcerated areas heal up, general health improve; and the mental effect on a sufferer who sees these things happening is, I think, not to be overlooked. There is at present no other method of treatment which holds out any hope of benefit in these inoperable cases, and I would almost go as far as to say that for the moral effect alone X-ray treatment would be a justifiable procedure, and even worth while though it did not produce the very extraordinary local effects which, in individual cases, we can all recall. Possibly X-ray and radium treatment may give place to other and better methods; in the meantime we have all of us seen some cases in which life, and—what is important—pleasurable, life has been materially prolonged. Research is going on in many directions, irradiation treatment is comparatively new; and the next twenty or thirty years may, and probably will, see this method in malignant disease become established on a much more definite technique and dosage.—C. T. H.]

Malignant Intrathoracic Tumours.—F. G. Chandler and C. T. Potter⁷ have investigated the after-results in 120 cases of primary malignant intrathoracic tumours of which 59 had been treated with X rays and followed up either to fatal termination or, if still alive, up to the present date. These conclusions are interesting but not very encouraging. The 61 cases not treated all died. The average duration of the disease from the date of the first treatment to death was 6 months for the cases untreated and 11 months for those treated by X rays. The authors can find no evidence that the treatment caused amelioration of symptoms; indeed, in many cases they were increased. Of 4 cases which were 'cured', they consider 3 as not having been malignant; 1 case, however, is passed as undoubtedly sarcoma: the growth disappeared, and the patient was alive and well four years later.

Malignant Disease of the Upper Air- and Food-passages has, according to R. Knox,⁸ become more satisfactory recently and since Regaud has shown that large quantities of radium used in a special way, and heavily filtered, will produce results in malignant disease of these regions very much better than had been possible formerly. Knox has used X rays on somewhat similar lines to this method of using radium—a strong dose in depth, with tube working at greater distance than usual, and with wax filters on the skin. He gives full particulars of his technique and his method of measuring the dose. Whilst laying stress upon accuracy in diagnosis before treatment, it is pointed out that the results of X-ray treatment will often be an indication of the nature of the disease. The author uses repeated blood tests as a check upon the dosage, and insists upon the importance of avoiding such dosage as would depress the natural power of the patient's resistance. Cases to indicate and illustrate the differential diagnosis and effect of treatment are recorded.

On the same subject, treatment by radium is very fully discussed by Sir W. Milligan,⁹ who illustrates his remarks with diagrams of growths of the larynx before and after treatment. This is a long paper and very comprehensive.

In a series of conclusions with which it closes, the author suggests, amongst other things, that surgery is the proper treatment if it is feasible; that lymphatic vessels should be treated; that the growth to be irradiated should, if possible, be exposed so as to admit of its being handled; that the radium (emanation) should be introduced into the growth in a large number of seeds which are to be retained *in situ*; that the main artery to the growth should invariably be ligatured.

Uterine Cancer.—The Ministry of Health have published a most important report by Dr. Janet E. Lane-Claypon,¹⁰ which is a statistical inquiry into the results of treatment from an analysis of the literature. It is based on an examination of medical papers at home and abroad up to 1926. Applying statistical methods, the author is able to show that, to obtain a survival rate of five years and over, treatment by radium is almost as efficient as abdominal hysterectomy; and if totally inoperable cases, many of which are treated by radium, were excluded, the figures for radium would be still better. Added to this, the operative mortality for abdominal hysterectomy is 17·3 and that for radium nil.

Irradiation of Tumours.—The experimental work of J. C. Mottram¹¹ on the radiation of tumours, with special reference to their blood-supply, was carried out from the point of view of endeavouring to find some cause for the facts that, in the clinical treatment of tumours by radiation, (a) there is a wide difference in the sensibility of tumours of different kinds, and (b) tumours of the same kind in different patients vary in sensibility. The experiments undertaken are described, and these led to the opinion that the varying sensibility to radiation of tumours, and the difference in sensibility between normal tissues and tumours, are associated with the variations in blood-supply, on which the radiation has a special action apart from the direct action on cells.

The Thymus Gland.—In a well-illustrated paper, J. Remer and W. W. Belden¹² describe the radiographic technique which is necessary both for diagnostic purposes of the presence of an enlarged thymus, and also for demonstrating the disappearance of the gland under treatment. This technique has to be standardized and carried out with great attention to detail if it is to be reliable. These writers urge X-ray treatment as that of selection; they describe their technique; and they conclude that treatment is highly satisfactory, and is in practically all the cases safe and a certain cure.

Erysipelas.—E. S. Platou and L. Rigler¹³ have treated 23 cases with X rays, with 18 controls by routine methods without X rays. Only one X-ray dose was given to each case, and it was immediately followed by a rapid improvement both locally and in the systemic manifestations. A comparison of figures showed that a clinical cure in the irradiated cases resulted in from 2 to 5 days, with an average of 3 days; in the controls the disease lasted 4 to 21 days, the average being 9 days. Further, 4 controls died, as against 1 treated with X rays.

Erythrocythæmia.—G. Milani¹⁴ has treated a case of this disease in a female 30 years of age with X rays. The spleen was enlarged, but, after noting the effects produced by irradiating the spleen and the long bones, the author concluded that the spleen was not the primary cause. Irradiation of the tibiae and knees brought about a diminution of the erythrocytes and an improvement in the symptoms. The main feature in this case was irradiation of the bones and not the spleen.

Diphtheria Carriers.—S. Withers, J. E. Ranson, and E. D. Humphreys¹⁵ have followed up previous work by Witherbee with regard to the treatment of diphtheria carriers with X rays, and confirm the successful results already

reported. The present paper is based upon the treatment of 54 cases, convalescents and carriers. Up to 60 per cent of an erythema skin dose was given, the voltage being 200,000. The full technique is explained. Twenty-three carriers, with an average positive culture period of 60.9 days, became negative within an average of 10.9 days after the first X-ray treatment.

Action of X Rays on the Embryonic Fowl.—An interesting series of experiments was undertaken by the late T. S. P. Strangeways and Honor B. Fell:¹⁶ (1) To investigate the effects of X rays upon chick embryos of different ages irradiated in ovo; (2) To discover the direct destructive effect of radiation and also its indirect action; (3) Also, if possible, to determine the nature of such indirect action. All the experiments made are described in detail, and the findings recorded and discussed. It is an instructive piece of work, which should be valuable to those practising X-ray therapy.

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RADIUM THERAPY, THE MODERN POSITION OF.

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Thirty-two years have elapsed since Professor Henri Becquerel read a paper before the Academy of Sciences at Paris in 1896, "Sur les radiations invisibles émises par les sels d'uranium". This communication induced physicists to investigate those substances which were found to possess radio-activity, and in 1898 M. and Mme. Curie announced their discovery of radium, which they had obtained from black oxide of uranium (pitchblende). In 1900 Devernie isolated actinium, and in 1905 Hahn thorium and mesothorium. These bodies, radium, actinium, and thorium, are the parent substances of the three radio-active series, viz., the radium series, the actinium series, and the thorium series. The two latter series are, however, of but little interest to any but physicists; it is the radium series almost entirely that has been utilized for the treatment of disease.

The therapeutic use of radium developed at first but slowly, and it was only after its destructive effects upon the skin, resulting from frequent handling of or prolonged contact with radium salts, had been noted, that its employment in surgery was commenced. In 1900 Professor H. Becquerel carried an insufficiently protected glass tube of radium in his waistcoat pocket for some hours. This was followed about a fortnight later by the appearance of an ulcer on his anterior abdominal wall, which did not heal for some months.

APPARATUS AND TECHNIQUE.

The earlier workers with radium employed it enclosed in small glass tubes, and depended principally upon the beta radiation for its effects. The reaction thus obtained was of an inflammatory or slightly ulcerative type, and was resorted to for the treatment of superficial lesions. The first forms of radium apparatus consisted of flat surface applicators, the radium salt being embedded in a varnish, or contained in a shallow cavity faced with a sheet of mica. Screens of different metals, and varying thickness, were gradually employed in order to eliminate the softer and more irritating beta rays, and ultimately this screening was carried to a point which permitted only the gamma radiation to be utilized.

As the radiation from radium is centrifugal in character, it was obvious that its maximum action would be obtained when the radium was inserted actually within the centre of the growth treated, and the appreciation of this fact led to the general employment of buried radium tubes, and the development of a special 'surgery of access' to ensure their introduction in the most effective situations. All workers with radium are agreed that treatment with buried tubes of radium salt or radium emanation gives the best results, but there are many differences in technique, and a great diversity of opinion as to dosage and exposure.

One school advocates the use of very small quantities, numerous tiny tubes, each containing 1 or 2 mgrm., being distributed throughout the substance of the growth or lesion treated, the exposures being of many days' or even weeks' duration. This method is based principally upon the fact that all cells are more vulnerable to radium radiation whilst undergoing division, and that as the mitotic period of different cells varies within very wide limits, these prolonged exposures ensure that the cells whilst dividing shall be exposed to radiation, and their degeneration induced.

Another school supports the employment of powerful tubes, each containing from 25 to 100 mgrm. of radium, embedded for from twelve to thirty hours, and claim that such a dosage, if properly distributed, will bring about the degeneration of the radiated cells irrespective of their period of mitosis.

A third school has exploited the use of 'seeds', which are tiny capillary glass tubes charged with one or two millicuries of radium emanation. These are distributed throughout the growth and allowed to remain there permanently. These seeds, however, being unscreened, emit a very intense beta radiation which is frequently productive of severe inflammation and suppuration. To lessen these disadvantages, some workers now encase the seeds in tiny screens of gold or platinum before embedding them, and it appears likely that this method will supersede the former one.

The matter of *screening* has been the object of much investigation, and trials have been made of practically all the dense metals—platinum, gold, silver, lead, aluminium, steel, brass, and monel metal having been employed. It is to be recognized that the action of screens is entirely physical, and affects only the quantity and nature of the rays transmitted—it has no effect upon their therapeutic properties. A screen of lead of 2 mm. thickness cuts off 99.63 per cent of the beta radiation, and permits 92.8 per cent of the gamma radiation to pass, and this screening, or its equivalent in some other heavy metal, should be employed when it is desired to use gamma radiation only. Lead being cheap and very easily worked is probably the metal most generally employed for screens, but it is too soft to be suitable for the manufacture of needle-pointed apparatus. Silver, platinum, gold, brass, steel, and monel metal are most commonly used for this purpose, silver holding the first place. Gold and platinum, by reason of their density, are best for the very small needle screens, and, as they do not corrode, their use is strongly to be recommended when prolonged exposures are contemplated.

The emergent secondary radiation which results from the passage of gamma rays through dense metal screens is of the soft beta type; it is absorbed by the immediately surrounding tissues, and frequently induces considerable irritation. This complication may be disregarded when a metal-screened tube of radium is actually buried within a growth or area of malignant infiltration; but if the tube be permitted to come into contact with healthy skin or normal mucous membrane, the consequent irritation by the secondary rays may occasion much discomfort. The secondary radiation has been shown to be directly proportionate to the density and thickness of the metal screen

employed, and this affords a powerful argument against the use of screens exceeding 2 mm. of lead or its equivalent. When necessary, the secondary radiation may be effectively absorbed by an additional screen of 3 mm. of rubber or 0.2 mm. of aluminium. The secondary radiation from a screen of 0.2 mm. of aluminium is so slight as to be negligible.

Radium apparatus—flat applicators or tubes—may be charged with radium salts or radon (radium emanation), the therapeutic effects being identical.

RADIUM SALTS.—The soluble salts of radium—the bromide and the chloride—are always converted into the insoluble sulphate before being used for the making of apparatus. The strength of all forms of radium salt apparatus is expressed in terms of radium element: hydrated radium bromide ($\text{RaBr}_2 \cdot 2\text{H}_2\text{O}$) contains 53.6 per cent; radium sulphate (RaSO_4) contains 70.2 per cent; radium chloride (RaCl_2) contains 76.1 per cent.

1. *Tubes.*—The strength of these apparatus varies very greatly. The smallest contain 1 mgrm., the largest 100 mgrm., of radium element, the range being 1, 2.5, 5, 10, 12.5, 20, 25, 50, and 100 mgrm. The smaller tubes, 1 to 10 mgrm., are of platinum, with walls 0.3 mm. in thickness, and iridium point. The larger tubes, 12.5 to 100 mgrm., are made from capillary glass tubing, and are used with outer screening tubes of silver, platinum, or lead as occasion demands. In all tube apparatus the contained radium sulphate is tightly packed to prevent any movement of the salt.

2. *Applicators.*—Rectangular, square, or circular. Their superficial area ranges from 1 to 30 sq. cm. They are made of three strengths: (a) 'Full strength', containing 0.5 cgrm. of radium element per sq. cm.; (b) 'Half strength', containing 0.25 cgrm. per sq. cm.; (c) 'Quarter strength', containing 0.125 cgrm. per sq. cm.

RADIUM EMANATION.—The strength of all radium emanation apparatus is expressed in millicuries. A millicurie is the amount of radon in equilibrium with one milligramme of radium element.

1. *Tubes.*—These are made of capillary glass tubing, and, as the radon can be condensed to a very great extent, it is possible to concentrate in them the unit of activity to an exceedingly high degree. Their size may vary in length from 0.3 to 1, 2, 3, 4, 5, or even more centimetres, according to the character of the case in which they are employed. The smallest of these tubes, measuring about 0.3 cm. in length and 0.1 cm. in diameter, usually are charged with between 1 and 2 millicuries of radon. They are termed 'seeds', and are buried in growths usually without any metal screening and allowed to remain there permanently.

2. *Applicators.*—These are hollow receptacles made either of thin German silver or glass. The former are usually made of similar shape to the radium-salt applicators, and may be square, rectangular, or circular. The glass containers may be made spherical, conical, oval, pear-shaped, or of any form to meet the requirements of the particular case treated.

The radiation emitted by a radium-salt apparatus is constant and uniform, whilst that from a radon apparatus steadily decreases, by reason of the loss of radio-activity accompanying the decay of emanation. The rate of decay of radon has been accurately estimated, its radio-activity falling to one-half in 3.85 days, and to one-fifth in 8.8 days. During the first twenty-four hours radon loses exactly 16 per cent of its activity. This renders it a perfectly simple matter to prepare a radon apparatus the mean activity of which for twenty-four hours shall be equal to that of a radium salt apparatus of known strength.

Both radium salts and radium emanation emit three kinds of rays, α , β , γ , their respective proportions being approximately 10,000, 100, 1.

The therapeutic value of the *alpha rays* is negligible, as they are unable to pass through the glass or metal wall of emanation containers, and in varnished or vulcanite-faced radium salt applicators only a few rays can escape through minute cracks. Further, their absorption is complete at a depth of 0.01 mm. from the surface of the skin.

The *beta rays* vary considerably in their velocities and power of penetration, and have been arbitrarily divided into 'soft', 'medium', and 'hard' beta. The 'hard' beta rays are reduced to about 6 per cent of their initial value in their passage through 1 cm. of the body tissues. For this reason, therefore, the therapeutic powers of the beta rays are most effective when dealing with growths or lesions not exceeding 1 cm. in thickness or depth.

The *gamma rays* possess intense penetrating powers, and complete absorption of them by the body tissues never occurs. A series of measurements made by Giraud showed that it required a thickness of 14.4 cm. of blood, or 7.6 cm. of muscle tissue, to reduce them to 50 per cent.

Apparatus unscreened, or so lightly screened as to permit of the passage of a preponderant beta radiation, is used principally in the treatment of skin diseases and affections of the mucous membranes—'superficial radium therapy'. In most of these cases, the exposure is usually so adjusted as to produce a definite surface radium reaction. This generally appears between the seventh and fifteenth day, and may vary from slight erythema to destructive ulceration, according to the length and intensity of the exposure. Four degrees may be clearly distinguished; (1) Simple erythema; (2) Erythema followed by vesication; (3) Vesication with superficial ulceration; (4) Deep ulceration, generally followed by the formation of a 'limpet-shell' crust beneath which repair takes place—this is the so-termed 'destructive reaction'.

Heavily screened apparatus emitting only a hard beta and gamma radiation is employed when dealing with most cases of malignant disease, and morbid conditions of the pharynx and larynx, the lungs and mediastinum, the stomach and intestines, the uterus and ovaries, the bladder, the spleen and liver, and the lymphatic glands—'deep radium therapy'. If sufficient care be taken to absorb the secondary radiation, there is little, if any, surface radium reaction, erythema followed by slight desquamation being the utmost that is likely to occur.

When treating deep-seated growths with a gamma radiation emitted from heavily screened apparatus applied externally, it is advisable to change the position of the apparatus at intervals of not more than ten or twelve hours, as this procedure greatly lessens the possibility of exciting even a slight degree of surface reaction. The adoption of 'cross-fire' and 'focal' radiation should be resorted to whenever possible, as in this fashion a much more uniform reaction of the area treated is secured.

"The intensity of the gamma radiation from a point source varies inversely as the square of the distance from the source". This is "the law of the inverse square". When dealing with a plane surface radium apparatus this law does not apply with absolute strictness, but the general principle holds good. If, therefore, a growth be radiated from one side only, the portion of the tumour in actual contact with the apparatus receives a much more intense and effective radiation than the distant portion does. If, however, a second apparatus of similar shape and strength and screening be placed on the distant side opposite and parallel to the first one, each surface of the growth will receive an equal radiation, and the intervening portions of the tumours be more evenly affected.

ACTION OF RADIUM ON LIVING TISSUES.

The effect of radium irradiation upon any living cell, if of sufficient intensity, and permitted to act for a sufficient length of time, shows three clearly established phases: (1) Increase of cell activity, with possible associated proliferation; (2) Arrest of cell activity; (3) Degeneration and destruction of the cell. No hard-and-fast line can be drawn between these three phases, the transition from stimulation to destructive irradiation being simply one of degree, depending entirely upon the intensity of the stimulus.

Experimental researches carried out by competent observers have shown that, other factors being constant, different varieties of cells behave differently to radiation of a given wave-length, and that the use of the term 'selective action' is thus to a certain extent justified.

When subjected to the action of radium rays, pathological cells respond in a fashion different from those of normal healthy tissues. They are more easily stimulated, their vitality is more quickly inhibited, and degeneration occurs at a more rapid rate. The main principle underlying all radium therapy is the correct estimation of the dosage and exposure necessary to bring about the death of the pathological cells, without appreciably affecting the functions and vitality of the normal ones, and so enabling repair to be accomplished satisfactorily. An insufficient dose may possibly act as a stimulus, causing increased growth. On the other hand, an over-dose may result in the destruction of normal tissues, leading to the formation of fistulæ, or the development of intractable ulceration.

Many theories have been advanced as to the exact manner in which the degeneration of radiated cells is brought about, but the matter has not yet been settled. Some observers are of opinion that minute changes in the blood-vessels are the principal factor in inducing the degenerative changes, and have brought forth some striking experiments in confirmation of this view. Disturbance of the colloidal equilibrium of the cells is a theory which finds considerable support, the assumption being that radiation, if sufficiently intense, will so upset the colloidal equilibrium that recovery is impossible, and degeneration supervenes.

Decomposition of the cell lecithin, and diminution of cholesterol content following upon radiation, have been held by other workers to be responsible for the lethal effects upon the cell, but a wholly satisfactory solution of the problem has yet to be found.

A pronounced *systemic disturbance* often occurs after prolonged exposures with a large quantity of heavily screened radium, and is especially noticeable in the treatment of conditions such as lymphatic leukemia, lymphadenoma, lymphosarcoma, and sarcomatous growths generally. It comes on usually about the third and fourth day after the termination of the exposure, and is evidenced by great languor, headache, nausea sometimes accompanied by actual vomiting, and a rise of temperature to 100° or 101°. These symptoms are no doubt due to auto-intoxication resulting from absorption of the products of the degenerated cells. Their disappearance may be expedited by the judicious use of laxatives and diuretics.

An important late effect of prolonged or frequently repeated radium irradiation is the *production of a fibrosis* from the organization of the largely increased number of fibroblasts which develop in response to the stimulation of the gamma rays. In many cases this process is a distinctly beneficial one, as it serves to encapsule any small isolated foci of malignant cells, and so arrest the progress of the disease. In other instances, and more especially when the exposures have been given within a cavity or canal—e.g., rectum or vagina—

an annular fibrosis may be induced, rendering regular periodic dilatation necessary, lest complete occlusion occur.

The condition of the patient's general health is a matter of paramount importance, and the existence of cachexia always militates greatly against successful radium therapy. Anæmia also exerts a deleterious influence, and, since frequently repeated gamma radiation will induce definite blood changes in patients, every effort should be made to bring their blood condition to normal before commencing the exposures. It is further advisable to conduct periodic examinations of the blood during the months or years that the patient is under radium treatment.

In patients suffering from *diabetes*, the reaction is often atypical, inflammation is intense and prolonged, and repair slow and imperfect. A total output of more than 30 grm. of sugar per diem, with the presence of diacetic acid, and a definite increase in the amount of blood-sugar, should be regarded as contra-indications to the employment of radium therapy, and steps should be taken to render the urine sugar-free or nearly so, reduce the blood-sugar to normal, and ensure the absence of diacetic acid before any radium treatment is given.

Tissues while acutely inflamed should not be subjected to radium irradiation, as it is impossible accurately to predict the extent and degree of the resultant reaction under such conditions. A more or less complete subsidence of the active inflammatory process must be secured before radium treatment is given. The chronic inflammatory changes, accompanied by dense leucocytic infiltration, which are frequently met with at the growing edges of malignant tumours, are, on the other hand, favourably influenced by radium irradiation, and their resolution is often speedily induced.

Sepsis is a frequent and very harmful complication, and is specially apt to prove troublesome in the mouth, larynx, vagina, and uterus. In such situations attempts should be made to secure a condition of surgical cleanliness before radiation. The removal of sloughs, the opening and cleansing of sinuses and abscesses, followed by repeated and regular irrigation of the regions with suitable antiseptic solutions, should be carried out for several days prior to the use of radium. If these precautions be neglected an increase of the septic process will be the inevitable sequel.

The Sensitiveness of Various Cells.—All cells are more vulnerable to radium irradiation when in a state of active nuclear division, and it is for this reason that the response of *rapidly growing or fungating lesions* to radium rays becomes evident much more quickly than in the case of slow-growing tumours of scirrhous type. Every effort should be made to secure as uniform a radiation as possible to all parts of a growth, and the employment of 'surgery of access' to ensure the accurate introduction and spacing of buried radium tubes is a factor of prime importance. When surgical measures are impracticable or inadvisable, 'cross-fire' radiation should be utilized to the fullest possible extent. Speaking in general terms, it is best to give a maximum dose at the first exposure; if it be necessary to repeat the treatment, the strength of the subsequent exposures must be diminished.

The sensitiveness of various types of pathological cells to radium differs widely. Lymphosarcomata are especially susceptible to radium irradiation, and their degeneration occurs very rapidly. Spheroidal-celled carcinomata are less quickly influenced, whilst squamous-celled epitheliomata are still more resistant. The chief changes noted in the various types of pathological cells after radium irradiation are briefly as follows: Squamous-celled carcinomata show great variability in the size and shape of the individual cells, with vacuolation of the cytoplasm and nucleus, and irregularity of the chromosomes. Spheroidal-celled carcinomata exhibit nuclear changes together with great

vacuolation of the cytoplasm. Columnar-celled carcinomata display nuclear changes and mucoid degeneration. Sarcomata show general rather than particular changes, and vary as to their prototypes, bone, fibrous tissue, cartilage, etc. Endotheliomata: the cells of these growths lose their power of cohesion, and may desquamate in large masses, but very little actual intra-cellular change occurs.

RADIUM THERAPY.

The field of radium therapy is widening steadily, and there can be no doubt, with the constant improvements in technique, and in the 'surgery of access', that many diseases will be dealt with in the near future which are at present left untouched. Clinical experience permits of the classification of the various diseases at present treated with radium into three principal groups:—

1. Those in which cure, either complete in the case of non-malignant, or apparent in the case of malignant disease, may be confidently anticipated: chronic eczema, seborrhœic dermatitis, lichenification, cavernous nævi, lymph-angiomata, keloid, acne keloid, papillomata, keratomata, corns, menorrhagia, menopausal hæmorrhage, rodent ulcer, lymphosarcomata, sarcoma of the nasopharynx.

2. Those in which great benefit, both local and symptomatic, may be expected to ensue: psoriasis, xanthelasma, xeroderma pigmentosum, Fordyce's disease, leukoplakia, capillary nævi, 'port-wine marks', spring catarrh, lupus erythematosus, lupus vulgaris, tuberculous adenitis, vicious cicatrices, Dupuytren's contraction (early stages), parenchymatous goitre, exophthalmic goitre, splenic leucocythæmia, lymphatic leucocythæmia, lymphadenoma, mediastinal tumours, epithelioma of the skin, epithelioma of cornea, epithelioma of vagina, epithelioma of urethra (female), Paget's disease, carcinoma of breast, carcinoma of prostate, carcinoma of thyroid, mycosis fungoides, endotheliomata, sarcomata (excluding endosteal), Mickulicz' disease, angioneurotic œdema, arthritis deformans (of septic origin).

3. Those in which the result is doubtful, some cases responding very well, others of like character failing to show any improvement whatsoever: pruritus, neuralgia, neuritis, epithelioma of tongue, epithelioma of mouth, epithelioma of antrum, epithelioma of fauces, epithelioma of larynx, epithelioma of œsophagus, carcinoma of stomach, carcinoma of intestine, carcinoma of rectum, myelomata, melanomata.

Skin Affections.—The number of skin diseases in which radium therapy is of value is not very large, and it should be recognized that only in those conditions where the disease is limited to a relatively small area is the application of radium practicable. Such conditions are lichenification, small patches of chronic eczema, seborrhœic dermatitis, lichen planus and psoriasis of limited extent, lupus erythematosus (but not the exanthematic type), keratomata, papillomata, corns, keloids, acne, lupus vulgaris, leukoplakia, xanthelasma, capillary and cavernous nævi.

It is difficult to formulate any general rules as to dosage and exposures, but it may be said that, when the epidermis is principally affected, unscreened apparatus of 'half strength' should be employed, and the exposures should vary from ten to sixty minutes, according to the effect it is desired to produce.

When the lesion is situated or originates in the corium or subcutaneous tissues, apparatus screened with 0.1 mm. of lead, 0.5 mm. or 1.0 mm. of silver, are used, as such screening absorbs all the 'soft' and most of the 'medium' beta rays, thus preventing their action upon the epidermis and upper layers of the corium.;

Rodent Ulcer: Basal-celled Carcinoma.—The results obtained by the radium in rodent ulcer taken as a whole are far superior to those from any other form of treatment; 90 per cent of rodent ulcers not exceeding 3 cm. in diameter, not affecting bone, cartilage, or mucous membrane, and not having been subjected to any previous treatment with caustics, ionization, or X rays, can be eradicated by one exposure. A 'full-strength' apparatus of suitable size should be employed unscreened, and an exposure of from one and a half to three hours' duration given, according to the character of the lesion. A brisk destructive reaction is induced, which is followed by the formation of a 'limpet-shell' crust, under which healing occurs, and is usually complete in about six weeks from the date of the exposure. The resultant scar is smooth, soft, and supple, the latter quality being due to the presence of a preponderance of yellow elastic tissue in the substance of the scar, a feature peculiar to the radium reaction.

When circumstances render an unscreened exposure impracticable or inadvisable, excellent results may be obtained from treatment with 'gamma' radiation only. A heavily screened 'full-strength' apparatus is used, and one exposure of twenty-four to thirty hours' duration given—if necessary for the patient's or operator's convenience, this may be divided into six periods of four or five hours each administered on successive days.

Radium will not cure rodent ulcer when it has attacked bone or cartilage, and in such cases the affected portions of these tissues must be removed by excision, or diathermy, before radium treatment is attempted.

Small Epitheliomata—squamous-celled carcinomata of the skin—may be treated in the same fashion as rodent ulcer, but the exposures should be longer—two to five hours with unscreened apparatus, as an intense destructive reaction is necessary. Further, the associated lymphatics should also receive a prolonged course of gamma radiation, with the object of destroying any malignant cells that may be permeating their channel.

Epitheliomata of the lower lip often respond in a most satisfactory fashion, and as the growth in these cases is generally of the fungating type, the action of the unscreened surface applicator may be supplemented by the burying in the substance of the lesion of small radium tubes screened with 0.3 mm. of platinum for from twelve to twenty-four hours.

Newcomet¹ reports the results of the radium treatment of 128 cases of superficial epitheliomata: 5 were not improved, 12 could not be traced, and 111 were greatly benefited. With epitheliomata of the buccal mucosa and tongue the results were not so satisfactory; but of a total of 29 cases, of which most were in an advanced stage, 9 were restored to health.

Cavernous Nævi.—The effects obtained in the treatment of this condition with radium cannot be equalled by any other method, but the process is a somewhat tedious one, and many exposures are often necessary to obtain a perfect cosmetic result. The treatment should be commenced as early as possible after birth, as if properly carried out it will not injure even the most delicate infant. Cavernous nævi, by reason of their shape and situation, are often particularly suitable for cross-fire radiation, which should be employed whenever possible. 'Half-strength' applicators screened with 0.1 mm. of lead are used, and exposures of from thirty minutes to one hour's duration given on each of three successive days. The series of exposures is repeated at intervals of six weeks until the desired result has been produced. Little or no surface reaction accompanies this method of treatment, and the infant experiences no pain or discomfort of any kind.

Capillary Nævi ('port-wine' marks).—The appearance of these blemishes can usually be greatly improved by radium, but a complete blanching of the affected

area is very rarely obtained. The intensity of colour can, however, be so much lessened that the skilful application of a grease pencil will render the lesion invisible. The treatment is identical with that indicated for cavernous nævi, save that the superficial character of capillary nævi renders 'cross-fire' radiation impracticable.

Carcinoma of the Tongue.—The earlier results of the treatment of this condition with radium were very unsatisfactory, but with recent improvements in technique, and the general employment of small buried tubes, much encouraging progress has been reported. Even now, however, operation is the method of choice if at all practicable, more especially when the growth affects the tip or anterior two-thirds of the tongue. When the posterior third is attacked, lymphatic infection occurs at a very early date, though it may not become apparent for some months or even years.

The primary growth should be treated by needling, the needles being inserted into the growth and into a small surrounding area of healthy tissue. The practice at the Radium Institute is to employ tubes of 10 mgrm., screened with 0.3 mm. of platinum, using from four to twelve according to the size of the tumour, and giving an exposure of from twenty to thirty hours' duration. If proper care be taken to render the tongue and buccal cavity as clean as possible before introducing the needles, septic infection rarely occurs, and the reaction does not occasion much pain. Some workers use a much larger number—twenty to forty—of small tubes containing 1 to 2 mgrm. each, embedding them throughout and around the growth, and giving exposures of several days' duration. In these cases septic infection and acute inflammation almost invariably develop, and cause the patient great discomfort. It is a moot question whether the final results of this method are any better than that of the one first described, and there is, in addition, the disadvantage that the patient occupies a bed in the hospital or nursing home for a much longer period. When the disease is extensive and there is great lymphatic infection the prognosis is bad, as, although healing and fibrosis of the primary lesion may follow upon the radium treatment, it never appears completely to arrest lymphatic dissemination, and the disease makes slow but steady progress. Prolonged gamma radiation of the enlarged glands and infected lymphatics will often do much to prevent implication and ulceration of the covering skin, delay dissemination, and prolong the patient's life in comparative comfort, but this is the utmost it can accomplish. In cases of early lymphatic infection where the glands are few in number, small in size, and freely movable, it is often expedient to remove the superficial affected glands without going the length of an extensive block dissection, and afterwards subject the whole area to a powerful gamma radiation from heavily-screened applicators.

Carcinoma of the Larynx.—*Extrinsic epitheliomata* of the larynx constitute a peculiarly depressing group of cases. They grow rapidly, lymphatic involvement is early and extensive, and prognosis is most gloomy. The treatment of the disease in early cases is surgical, but the condition quickly reaches an inoperable stage, and further shows a great tendency to recurrence after the most complete operation has been performed. In inoperable cases radium can do but little beyond retarding the progress of the disease, and sometimes relieving the pain. Prolonged gamma radiation from heavily-screened apparatus applied all round the larynx should be employed, and, if a tracheotomy opening exists, the primary growth may be treated by the insertion of one or more needles of 10 mgrm.—according to the size of the mass—screened with 0.3 mm. of platinum, for ten hours.

Intrinsic epitheliomata give much better results, and since they grow slowly, and lymphatic involvement occurs only very late, it is often possible

completely to arrest the progress of the malady. The primary growth should be treated by needling, a window being cut in the thyroid cartilage of the affected side. A preliminary tracheotomy should always be performed, as congestion attendant upon the radium reaction may cause obstruction of the glottis.

Douglas Harmer² reports a series of eleven cases of carcinoma of the larynx treated by radium alone. All of them were primary intrinsic growths. The method adopted in every instance was the cutting of a window in the thyroid cartilage of the affected side, and arranging in this window from five to ten radium needles parallel to one another and vertical. The needles were of platinum with walls of 0.5 mm., and each contained from 1 to 5 mgrm. radium. They did not penetrate into the growth or the larynx. The exposure varied from four and a half to eight days. The results are grouped in three classes: (1) Early cases in which the growth was strictly confined to one vocal cord, and could have been treated by laryngo-fissure—5 cases, 4 cures. (2) Advanced cases in which the disease was intrinsic, but had crossed the middle line—4 cases, 1 cure, 1 arrested, 2 dead. (3) Inoperable cases—2 cases, 1 cure, 1 dead.

Carcinoma of the Breast.—Inoperable cases of this disease are often greatly benefited by radium treatment, the progress of the malady being arrested, ulceration healed, and pain relieved. The lymphatic engorgement of the upper limb of the affected side is quite frequently much lessened, though in some instances no effect is produced. The prognosis is better in women who have passed the menopause. Corpulent patients of middle age are the most unsatisfactory to treat, the disease often being of the encephaloid type, and responding but poorly to radiation. Both tubes and surface applicators should be employed in the treatment, and it is advisable to give a heavy dosage at the first. Middlesex Hospital,³ in a report on fourteen cases of recurrent carcinoma of the breast, finds that, in advanced cases without hope of cure, treatment by radium will prevent ulceration of the recurrence, and so save the patient very much pain, and in earlier cases large doses often caused the tumour to disappear or retarded the growth. St. Bartholomew's Hospital³ states that the results of radium treatment of small primary growths of ordinary type are very encouraging. Newcomet¹ advises a very mild radiation when dealing with ulcerated cases of the atrophic scirrhus type, and says that this method, if carefully carried out, will induce healing of the ulceration, and retard the progress of the disease for many years.

Cancer of the Uterus.—The report of the Medical Research Council³ on cases of uterine carcinoma treated with radium at St. Bartholomew's Hospital, University College Hospital, Birmingham General Hospital, Cardiff Royal Infirmary, and Dublin, shows that of a total of 178 cases with inoperable disease, reported not less than one year after treatment, 120 had died, 27 were apparently free from disease, and 31 were alive but not cured. Of 16 border-line or operable cases, death had occurred in 4, 6 patients were apparently cured, and 6 were alive but not free from the disease.

W. D. Saltau¹ discusses results of 112 inoperable or border-line cases: 32 died, 71 were not benefited in any way, and 9 responded fairly well to treatment. Of these 9, 1 had been free of any symptom for a period of four years, 2 for two years, and the others for periods varying from one to two years. As regards the amount of symptomatic benefit resulting from radium treatment, he states that hæmorrhage was permanently arrested in 41 per cent, and that the discharge entirely cleared in 30 per cent, and for these reasons alone, though radium may have no curative action in many cases, the treatment is justified. Six operable cases received a course of pre-operative radiation: 3 of these were reported as being quite well after two or three years. Sixteen patients received

post-operative irradiation: 4 did well, 1 died, 3 had recurrences, and the remaining 8 could not be traced.

The method adopted by most workers in the treatment of cancer of the cervix is the introduction of a tube of from 50 to 100 mgrm. of radium element, screened with not less than 1 mm. of silver, or its equivalent in some other heavy metal, into the cervical canal for from 29 to 40 hours; supplementing this, when the disease is extensive, by the needling of the paracervical tissues with one or more smaller tubes. The total dosage at the hands of various operators ranges from 3000 to 6000 mgrm. hours. The method of treatment by the burying of many small tubes, each containing 1 to 2 mgrm. of radium element, distributed throughout the growth and allowed to remain for several days, has its own supporters; but this procedure is often accompanied by much septic inflammation, which is a serious disadvantage. The routine treatment at the Radium Institute is the insertion of a powerful screened tube into the cervical canal, and needling of the paracervical tissues with numerous small needles each containing 10 mgrm., and with walls of 0.3 mm. platinum—exposure 24 to 36 hours. This dose usually proves very effective, and the risk of septic infection is but slight.

Cases of cancer of the body of the uterus form about 2 per cent of all cases of uterine cancer. If operation is refused or negatived for any reason, the introduction of a tube of 100 mgrm., screened with 1 mm. of silver, within the uterine cavity for 24 to 30 hours, usually quickly arrests the discharge and hæmorrhage, and renders the disease quiescent.

Chronic Metritis: Uterine Fibrosis: Menopausal Hæmorrhage.—The menorrhagia or metrorrhagia associated with these conditions often responds in most satisfactory fashion to radium therapy. The cervical canal is dilated, the uterine mucosa curetted if this procedure is considered necessary or advisable, and a tube of 50 mgrm. of radium element, screened with 2 mm. of lead and 3 mm. of rubber, is introduced into the uterine cavity for 24 to 30 hours. One such exposure usually proves effective. If the patient be past the child-bearing age, and there is no objection to the premature induction of the menopause, the internal radiation may be supplemented by external radiation from flat applicators screened with 2 mm. of lead and rubber, and applied over the fundus and ovaries. The first result of the treatment is often an increase of the flow at the next menstrual period by reason of the congestion attendant upon the radium reaction, but successive periods show a decrease in the amount lost until the flow returns to normal or amenorrhœa occurs.

Uterine Fibroids.—In cases where operation has been refused or negatived, the employment of radium is quite justifiable, more especially when uterine hæmorrhage is the principal trouble. Pressure symptoms may also be relieved, though not in so definite a fashion, and, if the growth is fibromatous rather than myomatous in character, the amount of shrinking following upon radiation will not be very great.

Some judgement should be exercised in the selection of cases of uterine fibroids for radium treatment. The cases which are most likely to be benefited are those in which the growth is relatively soft, moderate in size, and not the subject of inflammatory or degenerative changes. The best results are obtained by the use of both internal and external radiation, a tube of 50 to 70 mgrm., screened with 2 mm. of lead, being introduced into the uterine cavity, and flat applicators, containing 100 mgrm. and screened in similar fashion, applied over the fundus. An exposure of twenty-four hours should be given, and may, if necessary, be repeated after an interval of three or four months.

Cancer of the Rectum.—Operation is the method of choice whenever practicable, but if this be impossible, or the patient declines to submit to surgical

measures, the employment of radium is justifiable. Patients suffering from cancer of the rectum differ widely in their response to radium, and in a considerable number the results must be regarded as disappointing. Needling of the growth is the most effective procedure, and is best carried out from the external aspect, the tubes being introduced through an incision or incisions in the ischiorectal fossæ, and a finger kept in the rectal canal during the procedure to help to determine the positions and depths at which the needles are inserted. In female patients, when the growth is situated in the anterior rectal wall, the needling may be carried out per vaginam. In advanced cases, when the growth is annular in type, obstruction threatened, and the patient averse to colostomy, a 100-mgrm. tube screened with 2 mm. of lead and rubber, inserted into the lumen, will often do much towards increasing its patency, and so postponing the time at which colostomy will become imperative. In all cases of rectal carcinoma the patient should be advised to submit to a colostomy before radium treatment is started, as the constant passage of feces over the growth stimulates its activity, and increases the pain of the reaction. In very susceptible patients proctitis is frequently a concomitant of the reaction, and may cause much discomfort. Rectal irrigation with a weak, warm glycothymoline lotion, followed by the introduction of a gall and opium enule, will generally give great relief. (*See also* RECTUM, CANCER OF.)

Radium in Ophthalmology.—Dr. Louisa A. Lane,⁵ as a result of numerous experiments with radium on the eyes of normal rabbits, finds that the application of unscreened radium occasions definite irritation of the conjunctiva, cornea, and sclerotic, with some increase of the intra-ocular tension. With a high dosage the iris, ciliary body, retina, and optic nerve are also affected. When a screening of 0.5 mm. of silver and 1 mm. of rubber, and a dose of 150 to 200 millieuries, are employed, the lids, cornea, iris, and fundus structures have shown changes clinically and histologically. This renders it evident that a silver screening, which admits considerable beta radiation, is injurious to the rabbit eye. After eliminating all beta radiation by the use of platinum gold screening, it was found that the reaction was slight, the gamma radiation causing much less injury to the eye tissues generally. In her report on the use of radium in the treatment of patients with diseases of the eyes, she is of opinion that the best results are obtained by the use of gamma radiation in small amounts over an extended period of time.

Capizzano⁶ has treated 70 cases of *epithelioma of the eyelids* with radium exclusively, and reports cures as 74.28 per cent.

Epithelioma of the cornea generally yields quickly to radium. The growth is usually more proliferative than invasive in character, the cornea being very dense and resisting the down-growth of the epithelial columns. One exposure of an hour's duration with a suitable sized 'full-strength' applicator will usually bring about a rapid and complete cure. The percentage of recurrence is but slight.

Sarcomata.—These tumours, and more especially the spindle-celled and periosteal varieties and lymphosarcomata, are often most favourably influenced by radium, the growths disappearing completely, or becoming shrunken or fibrosed. Treatment must be vigorous, and a large quantity of radium should be used, the applicators being disposed in such fashion as to procure an equal intensity of radium in all parts of the growth; and this is best accomplished by the burying of one or more radium tubes, screened with 1 mm. of silver, within the mass, powerful applicators screened with 2 mm. of lead being placed over and around its circumference. Prognosis is worst in the case of the small round-celled, and best in the small spindle-celled, sarcoma, the latter type often approximating very closely to a true fibroma. It would appear that the

effect of the radium rays is to check the tendency to cellular proliferation and to increase the formation of connective-tissue fibres, thus transforming a malignant into a non-malignant neoplasm.

Pre-operative and Post-operative Radiation.—Pre-operative radiation is used by many surgeons, as the results of numerous experiments by competent observers have shown that it devitalizes the malignant cells so that they are not easily transplanted; and further, that tissues which have been radiated do not easily take cancer cells when implanted. It is employed principally in cases of *carcinoma of the breast and of the uterus*, the whole operation area and associated lymphatics receiving a prolonged gamma radiation. Too long a period should not be permitted to elapse between the radiation and the operation; otherwise a certain degree of fibrosis may occur, which will add to the difficulties of the operation.

Post-operative radiation is now a routine procedure after removal of a breast for carcinoma in the practice of many operators, as by its adoption the chances of recurrence are very definitely lessened. Prolonged gamma radiation is invariably employed, and is carried out by burying heavily screened tubes in the axilla and in the first and second intercostal spaces of the affected side, supplemented by numerous flat, heavily screened applicators distributed over the surface of the whole of the operation area. The irradiation obtained in this fashion will suffice to exert a lethal action on any disseminated carcinomatous cells in the surrounding tissues or lymphatics. For this reason it is of particular value in those cases where the dissemination is extensive and it has been found impossible to operate well beyond the appreciable area of the disease.

Many gynaecologists also view with favour post-operative radiation *after removal of the uterus for cancer*; but caution must be observed as to the time at which this treatment is carried out, especially if a Wertheim's operation has been performed. The elaborate and extensive dissection associated with the removal of the uterus by Wertheim's method may definitely impair the functions of the trophic nerves, and, if a heavy dose be administered before they are fully restored, serious effects, accompanied by destruction of normal tissue, may ensue. For this reason, therefore, it is advisable to permit a period of six weeks or two months to elapse between operation and radiation.

RADIUM IN INTERNAL MEDICINE.

Methods of Administration.—Radium may be administered in the form of radium salts, radon, or radio-active deposit.

RADIUM SALTS.—The soluble salts, bromide or chloride, are dissolved in distilled water, and administered either by drinking or as an intravenous injection. The strength of the solution is expressed in microgrammes of radium element, and for drinking purposes the solution usually contains 3 microgrammes per 100 c.c., the dose being from 100 to 250 c.c. daily. The solutions used for injections are more concentrated, and the strength ranges from 10 to 100 microgrammes radium element dissolved in 2 c.c. of normal saline.

RADON.—(a) *Inhalation*: This method obtained a great vogue on the Continent in the years immediately preceding the war. Most of the spas and bathing establishments were provided with radium emanatoria, luxuriously equipped buildings containing rooms the air of which was refreshed from time to time with radon and oxygen, or radon only. The patients undergoing the treatment were immured in these rooms for periods of three, four, or more hours daily, during which time they breathed the radon-charged air. The expired air was purified by passage over caustic soda, and then returned to

the room. This method of treatment made slight headway in the British Isles, and it now appears to be but little favoured on the Continent. (b) *Ingestion*: Radon is dissolved in water and administered to patients daily for six, nine, twelve weeks, or even longer. The strength of the solution employed at the Radium Institute is 2 millicuries per litre, and of this patients take 250 c.c. daily.

RADIO-ACTIVE DEPOSIT.—This is collected on metal foil and dissolved in water, and may be used either as an intravenous injection or as a solution for drinking. Its therapeutic effects are identical with those of radium salts and radon.

Elimination and General Effects.—Numerous experiments have been made by various observers to determine the channels through which *elimination of radium from the body* takes place. It has been shown that, when radium-salt solutions are administered, elimination occurs principally through the faeces, a small amount escaping with the urine, and a very tiny amount as radon from the lungs. With radon solutions elimination occurs quickly and almost wholly through the lungs, a very small amount being excreted by the kidneys.

The *general effects* following upon the internal administration of radium in therapeutic doses are: (1) Increase in the number of red blood-corpuscles and hemoglobin content; (2) Diuresis, sometimes combined with a slight laxative effect; (3) Increase of katabolic changes, more especially with respect to output of uric acid, kreatinin, and purins; (4) Decrease of blood-pressure, more definite in gouty and arthritic subjects; (5) Relief from pain in some cases.

Conditions Benefited by the Internal Administration of Radium.—The number of these is not very great.

Arthritis deformans is probably the disease in which this form of treatment is used to most advantage, but persons vary very greatly in their degree of response. Most good is to be anticipated when the patient is under 40 years of age, the disease of but short duration and infective in origin, and the changes are peri-articular in type and multi-articular in distribution. In susceptible subjects the general health is greatly benefited, the muscular tone improves, pain lessens or disappears, and sleep becomes sound and undisturbed. Digestive disturbances of slight degree are also often abolished, and the actions of the bowels become freer and more regular.

Angioneurotic oedema sometimes yields in amazing fashion to the ingestion of radium or radon solutions, after all other therapeutic measures have failed. As a general rule, extremely free diuresis is noted within a few days of the commencement of the treatment, the oedematous swellings steadily become reduced in size, pain and stiffness disappear, and the health returns to normal.

High Blood-pressure.—Experiments on animals subject to the action of radon by inhalation have shown that its effect is to produce a fall in blood-pressure which may persist for some time. The same phenomenon has been noted in some patients whilst undergoing internal radium treatment, and on this account the administration of radium or radon solutions has been suggested for the relief of high blood-pressure. E. V. Allen, H. H. Bowring, and L. G. Rowntree⁷ have made careful records of the variation in blood-pressure in a series of twenty-two patients suffering from hypertension, and treated by injection of solutions of radium chloride. They conclude that radium chloride injections sometimes lower blood-pressure, occasionally quite markedly; but that the same results can easily be obtained by other and simpler methods.

REFERENCES.—¹*Therap. Gazette*, 1926, Oct., 685; ²*St. Bart's Hosp. Rep.* 1927, ix; ³*Med. Research Council Special Report*, Series No. 112, 1926; ⁴*Med. Jour. of Australia*, 1927, March, 403; ⁵*Jour. Amer. Med. Assoc.* 1927, Jan. 22, 234; ⁶*Ibid.* June, 2006; ⁷*Ibid.* Jan. 15, 164

RANULA.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The common cystic tumours in the floor of the mouth are ranula, dermoid cyst, and bursal cyst. The last projects more distinctly in the neck, and arises probably from the bursa above the hyoid bone. It occupies a space between the symphysis and the hyoid bone, and may enlarge to the size of an orange. Ranula is more often the size of a small walnut, is situated under the tongue, pushing this organ upwards and backwards and interfering with swallowing and speech. The wall of the cyst is thin, and its contents consist of a thick mucoid fluid. Wharton's duct sometimes may be seen lying on the surface of the cyst. A probe passed into the duct demonstrates the fact that the duct and the ranula do not necessarily communicate. Ranulæ are found commonly amongst the lower animals. It is very difficult from the literature to ascertain the origin of this type of cystic swelling. At one time it was taught that it owed its origin to a dilatation of one of the mucous glands in the floor of the mouth. This theory was supported by the fact that the contents consist of simple mucus and not salivary secretion. Von Recklinghausen, according to Erichsen, thought that the particular structure affected was the gland of Blandin, a mucus-secreting gland which usually lies beneath the tongue, close to the middle line. Again there are reports of ranula resulting from wounds of the mouth in the situation of Wharton's duct.

D. C. L. Fitzwilliams¹ states that many attempts have been made to confine the term to certain swellings, but none have succeeded. He refers to a paper by Thompson² describing as the one and only cause a persistence of the cervical sinus in connection with the branchial clefts. Fitzwilliams thinks that ranula may take origin in the mucous glands, the sublingual gland, Blandin's gland, or in the submaxillary gland. In former days many dermoid cysts were included as congenital ranulæ. Only twenty cases of congenital origin have been known. One case came under the notice of Fitzwilliams. Usually the cystic swelling develops in a quiescent manner, but there are some cases which may be classified as acute. These are generally formed in connection with the submaxillary gland. A cystic swelling develops under the tongue suddenly and with great rapidity. The pain is acute; breathing is embarrassed, and the patient may become cyanotic. Blockage of the duct by a stone or other obstruction would produce such a condition. A piece of straw, a splinter of wood or fish bone, or the bristle of a tooth-brush, may find its way into Wharton's duct and cause blockage. Fitzwilliams mentions large bilocular and burrowing ranulæ, the origin of which it is impossible to ascertain. They emerge from the mouth, spread to the face, the fauces, or the neck, to such an extent that the small tumour of the mouth appears negligible beside the huge tumour in the neck or face. Clinically, the extension is the most important, as well as the largest part of the condition. Fitzwilliams states that these cases sometimes gave rise to alarming symptoms, which are illustrated in the case reported by Wheeler³ :—

The patient suffered from a large ranula complicated by a tumour beneath the jaw. The usual signs of ranula were present, better marked than in the generality of cases. The tumour beneath the jaw was the size of a Seville (bitter) orange. She had known of the ranula for about a year, but was unaware when the tumour appeared beneath the jaw. The two tumours were thought to be distinct from one another. The appearance of the latter tumour gave one the impression that there was a calculus in Wharton's duct. A piece of the cyst beneath the tongue was excised, and glary fluid came out, and later some dark fluid. Pressure beneath the jaw caused a further flow and emptied the tumour. Notwithstanding that a 'large piece of bone' was removed from the ranula, the swellings reappeared.

One day she was in her usual health, but by the evening she was suffering intense dyspnoea, her eyes were starting from her head, the countenance was anxious and distressed, and she was in a cold perspiration, sitting up grasping the bedclothes like

one with asthma. Both tumours had increased greatly. An incision was made into the dorsum of the tongue on each side near the raphé. As not much relief was obtained, incisions were made into the two swellings, and fluid escaped from both and relief followed. The epiglottis could now be felt, and as it was swollen it was scored with a knife. Poultices and fomentations were applied and the patient managed to swallow half a teaspoonful of milk. Next day the tumour beneath the jaw was opened and its cheesy contents were removed. Complete healing followed.

In this case, if the 'piece of bone' removed was really a calculus as it had been suspected, then it merely proves that an ordinary obstructive ranula may form a large cyst beneath the jaw. The 'cheesy' consistence of the contents might mean that this case should not be included here but was really a dermoid. In a case of Malcolmson's,⁴ however, the contents were not only cheesy but solid in parts, though derived from the submaxillary gland. Tay also removed five masses like hard butter from a ranula, and Leclerc let out glairy fluid and sandy material.

The conclusions drawn are that ranula may arise in the salivary glands, including Blandin's gland, and in the mucous glands, and nowhere else. There is nothing to favour the view that Fleischmann's bursa exists, and there is nothing to connect a ranula with the supposed survival of a cervical sinus. From a practical point of view it must be remembered that in many cases of ranula the ducts of the submaxillary glands or sublingual glands may be demonstrated as apart from the ranula. In a number of cases there is no enlargement or thickening about the salivary gland. The cyst can usually be excised intact by dividing the thin mucous membrane lying over it and by gentle gauze dissection. Just as in the removal of a sebaceous cyst the wall may burst and the contents be extruded, and in some cases it is difficult to get away the deeper portion of the cyst wall. If the ranula can be removed intact the operation is completed by the introduction of a few interrupted catgut sutures, but if some part of the wall is remaining behind it is better to leave the cavity freely open.

REFERENCES.—¹*Brit. Jour. Surg.* 1927, Jan., 472. ²*Ann. of Surg.* 1920, LXII, 164; ³*Med. Press and Circ.* 1880, XXIX, 188; ⁴*Calcutta Med. and Physical Trans.* VII, 13.

RAYNAUD'S DISEASE. (See also EYE AFFECTIONS.) Ivor J. Davies, M.D.

E. P. Poulton¹ states that the treatment of this rare affection is apt to be neglected, for it is only too commonly regarded as being both incurable and irremediable. Raynaud's disease is a general condition due to vasomotor disturbances in various parts of the body. Syphilis is a possible primary factor, and appropriate treatment should be applied as soon as possible whenever this cause is proved to be present. When the uric acid in the blood is high, treatment with one of the cinchophen compounds such as **Atophan** (dose 15 gr. three times a day for three days in each week) should be tried. The general health should be kept at the best possible level, with residence in a warm country, as Egypt, during the winter, when possible. Einhorn states that the administration of large quantities of **Normal Saline** (0.85 per cent) through a duodenal tube abolishes the clinical features of Raynaud's disease. Poulton has confirmed this view in several cases. In mild cases, instead of the foregoing, 2 pints of saline may be drunk in the morning. Intravenous injection of **Radium Emanation** in normal saline is recommended by Tominek, of Prague.

Local measures, as warm clothing, thick gloves, friction of the hands or neighbouring parts, hydrotherapy, galvanic electricity, are helpful.

REFERENCE.—¹*Lancet*, 1926, ii, 1282.

RECTUM, INFLAMMATION OF. (See PROCTITIS, ULCERATIVE.)

RECTUM, PROLAPSE OF : Third Degree (Colorectal Invagination).*J. P. Lockhart-Mummery, F.R.C.S.*

K. Monsarrat¹ writes on this form of prolapse, in which the colon prolapses into the rectum, but no protrusion occurs at the anal orifice (exceptionally it may do so); it is, in fact, an invagination of the colon into the rectum, the rectal wall taking no part in the deformity. It is of particular importance because the diagnosis is not easy and it may give rise to symptoms otherwise unaccountable. It may occur as an acute condition simulating intestinal obstruction, or as a chronic condition with intermittent pain in the rectum for which no cause can be found. The condition so closely simulates the common features of cancer that it is only by examination with the sigmoidoscope that the diagnosis can be established. The symptoms are pain and bearing-down feeling, with the discharge of blood and mucus. Treatment is by operation, **Colopexy**. It is pointed out that disinvagination may be difficult on account of oedema of the invagination. Fixation should not be to the anterior abdominal wall, but to the left iliac fossa as low as possible. The peritoneum and fascia in this region should be incised for a distance of six inches, and the gut sewn to the edges of this incision by a good number of stitches. If the gut is thoroughly fixed the results of operation are good.

REFERENCE.—¹*Brit. Jour. Surg.* 1926, xiv, July, 89.

RECTUM AND COLON, CANCER OF. *J. P. Lockhart-Mummery, F.R.C.S.*

Early Diagnosis of Cancer of the Rectum and Colon.—Now that operations for resection of growths in the rectum and colon are showing such good results both as regards immediate mortality and subsequent recurrence, as compared with the operations of twenty years ago, it is becoming more and more obvious that the most important factor in treating these cases is earlier diagnosis. Even at the present time over 60 per cent of all cases of carcinoma of the rectum presenting themselves for treatment are already quite inoperable. It cannot be doubted that this percentage is much too high and can be reduced. It is only by careful examination of all patients exhibiting suspicious symptoms that we can expect earlier diagnosis. There is no serious difficulty in these days in making the diagnosis with the aid of the sigmoidoscope, a bimanual examination, or X rays, at quite an early stage of the disease, provided that the early symptoms are detected which will result in an examination of the patient.

G. E. Binkley¹ points out that the early symptoms vary according to the position of the growth: (1) *Growths of the pelvic colon* first give rise to symptoms of partial obstruction of the bowel lumen. Flatulence and constipation are almost always present, and attacks of acute colicky pain occur with increasing frequency. These attacks are particularly noticed on the day following large meals and after taking aperients. Occasional attacks of diarrhoea are also common. At a later stage purgatives tend to produce flatulence and distention rather than any satisfactory action of the bowels. (2) *Growths of the rectosigmoid junction* may cause symptoms resembling a colon or a rectal growth. (3) *Mid-rectal growths*: the passage of blood, usually in small amounts, accompanied by marked irregularity of the stools and a tendency to spurious diarrhoea, are the common symptoms. A desire to go to stool which has no result, or no adequate result, is very common. A bearing-down feeling is sometimes complained of. (4) *Growths of the lower rectum and anal region*: pain and discomfort are common early symptoms, together with the passage of blood and slime. Constipation and irregularity of the bowel actions are an early symptom. The author points out that 80 per cent of all cancers of the lower alimentary tract are within reach of the index finger.

Sarcoma of the Rectum.—J. H. Weeks² concludes that this is a very rare lesion, only 100 cases being found in the literature. The symptoms differ but little from carcinoma, and there is little difference in the age incidence. Males suffer more frequently from this form of sarcoma than females, in the proportion of 5 to 1. He concludes that X rays and radium are useless in its treatment. Early and very radical operation affords the only hope of cure, which even then is not good owing to the tendency to early metastasis.

TREATMENT.—A number of papers have appeared during the year dealing with this subject. It is noticeable that while some surgeons still advocate the abdomino-perineal resection in one stage for all cases of cancer of the rectum, there is a decided tendency towards the performance of less drastic and safer procedures for the majority of cases, the more drastic procedure being reserved for those cases which cannot be dealt with adequately except by the complete abdomino-perineal resection in one stage. There are still far too few satisfactory statistics covering a large number of cases treated by the different methods now in vogue to draw very definite conclusions, but it is already obvious that very good results as regards freedom from recurrence can be secured by perineal resection in two stages. The mortality from this operation is very low, under 5 per cent. The high mortality which is inevitable with the abdomino-perineal resection is not justified in view of these results, except in such cases as cannot be dealt with by the safer operation.

Professor Rouse³ describes a modification of the ordinary abdomino-perineal technique, having for its object the restoration of the rectum. The rectum is freed from above in the usual manner, great care being taken to preserve the blood-supply to the lower segment. If the colon cannot be freed sufficiently to enable the healthy part of the colon to reach the anus, the colon is further freed by division of the peritoneum on the outer side, even freeing the splenic angle if necessary. A new peritoneal floor is formed after pushing the freed colon into the pelvis. The patient is then placed in the lithotomy position, the rectum is dissected out of the sphincter and after free stretching of the muscle, and when freed the bowel is drawn out. The proximal end of the colon is stitched to the skin after removing the rectum, and drainage is provided in front of the coccyx. A tube is also placed in the bowel. He claims for this procedure that complete restoration of function is secured, and is sufficient compensation for the increased risks of the operation. He admits that the mortality-rate is high, about 30 per cent. Similar operations were performed in this country some fifteen years ago, but most surgeons of experience in England have discarded them on account of the very high mortality-rate which they involved, although they did enable normal function to be restored.

The After-results of 200 Cases of Perineal Excision of the Rectum for Cancer.—This large series has been carefully studied by the present writer,⁴ partly to show the mortality, but chiefly to ascertain what the recurrence-rate is after this operation. He concludes that when the operation is performed under the most favourable conditions, as in the case of private patients, the mortality-rate is only 3 per cent and the percentage of cures on a five years' basis is as high as 50 per cent. All the cases were grouped into three classes: 'A', very favourable cases where the growth was small and no invasion of the tissues had accrued; 'B', medium cases, where the growth was large and some invasion of surrounding structures was present; and 'C', bad cases, where there was fixation, involvement of glands, etc., i.e., borderline cases with a bad prognosis. It was found that, taking the 'A' cases only, the proportion of cures from operation on a five-years' basis was as high as 73 per cent, i.e., 73 per cent of these 'A' cases were alive five years after operation, while in the 'B' cases there were only 44 per cent alive. Thirty-nine cases were traced beyond the

five-years' period, with the following results, showing the number of years that have elapsed since operation :—

Cases	Years	Cases	Years
1	21	3	9
2	14	7	8
2	11	8	7
3	10	13	6

These results are encouraging, as they bring the results of operation for cancer of the rectum into comparison with cancer of the breast as regards both mortality and freedom from recurrence.

Technique of Colostomy.—A discussion on this subject took place at the Royal Society of Medicine⁵ in May, 1927. There was a general agreement on the use of a glass rod to form a good spur in performing the operation, and on the necessity for a small incision in the abdominal wall. Opinions differed as to the best site for the opening, but the majority of surgeons favoured a high position in the abdominal wall and an incision through the left rectus muscle. There was a consensus of opinion as to the marked benefits generally of an early colostomy in inoperable cases of cancer of the rectum. Opinions differed as to the best method of controlling a colostomy opening, some favouring a daily wash-out, and others believing that the bowel should be allowed to act naturally if possible.

Elliot H. Hutchins⁶ advocates bringing the proximal end of the colon, after freeing it as far as necessary, through a long tunnel in the abdominal wall between the muscles. This tunnel passes from the left loin across to the right side of the abdomen, where the end of the colon is brought through on to the skin surface near McBurney's point. It is claimed for this procedure that it enables the patient to obtain better control over the opening. It seems very doubtful if any permanent benefit will result from this procedure, and it must considerably increase the risks.

Radium in Rectal Cancer (see also RADIUM THERAPY).—Sir C. Gordon Watson⁷ reported 15 cases of carcinoma of the rectum treated by the insertion of radium needles into and around the growth. The base of the growth was freely exposed by open operation, and platinum needles containing 2 to 3 mgrm. of radium were inserted into the growth parallel with each other and roughly 1 cm. apart. The wound was packed and then treated by the Carrel-Dakin method. The needles of radium were left in position for about ten days and then removed. Of the 15 cases treated, 13 were hopelessly inoperable. One of the inoperable cases improved so much that it was subsequently operated upon. Of the remaining 12 inoperable cases, 4 are dead. The remaining 8 have all benefited from the treatment: in 2 the growth has apparently entirely disappeared. Of the 2 operable cases, in one the growth was apparently destroyed by radium treatment, but recurred in fifteen months. The other case is apparently cured as the result of the radium. With the exception of one, a squamous-celled carcinoma, all were columnar-celled carcinoma. Two cases were shown at the meeting, both apparently cured. No growth at all could be detected, and the mucous membrane was quite smooth and free from ulceration. Sufficient time has, of course, not elapsed to be sure that these cases are really cured, but there can be no doubt that this method of using radium is a valuable one in inoperable cases and a great improvement on methods hitherto practised.

Anæsthesia in Operations for Rectal Cancer.—There is an increasing tendency to avoid the use of chloroform or ether for these operations, and to depend upon regional or spinal anæsthesia, preferably with the addition of either gas and oxygen or morphia-scopolamine narcosis. The great reduction in the immediate risks of operation and the post-operative complications which has

resulted from these latter forms of anæsthesia has led to their more or less general adoption. Leo Bell⁸ recommends regional anæsthesia by parasacral and epidural infiltration through the sacral foramina. J. S. Lundy and C. F. McCusky⁹ advocate *caudal and trans-sacral block* with a solution of 5 min. of a 1-1000 solution of **Epinephrin** to each 100 c.c. of **Procaine Hydrochloride** for rectal operation, and speak well of the results. They point out that a patient who is a bad risk from an operative point of view can be made a good risk by judicious use of regional anæsthesia combined with suitable amounts of morphia.

REFERENCES.—¹*Amer. Jour. Surg.* 1926, i, 87; ²*Surg. Gynecol. and Obst.* 1927, April, 487; ³*Practitioner*, 1927, May, 284; ⁴*Brit. Jour. Surg.* 1926, xiv, July, 110; ⁵*Proc. Roy. Soc. Med.* (Proct. Sub-sect.), 1927, 1451; ⁶*Surg. Gynecol. and Obst.* 1927, Feb., 225; ⁷*Pr. c. Roy. Soc. Med.* (Proct. Sub-sect.), 1927, Nov. 6; ⁸*Surg. Gynecol. and Obst.* 1927, April, 556; ⁹*Atlantic Med Jour.* 1926, Oct. 30.

RED SQUILL AS A RAT POISON. *Joseph Priestley, B.A., M.D., D.P.H.*

A leaflet, dated Aug. 1, 1927, has been issued by the Ministry of Agriculture and Fisheries, definitely advocating the use of red squill poison in baits intended for the destruction of rats and mice, in preference to other stronger poisons sometimes used, such as strychnine, arsenic, and phosphorus. Especially on farms and in places where, owing to the presence of poultry, live stock, domestic animals, or stored food supplies, special care is necessary, red squill is particularly recommended for use. Red squill poison is extracted from the red squill bulb (*urgingea maritima*), which grows on the sandy shores of the countries bordering the Mediterranean Sea. The poison may be given as bait, powdered or liquid, mixed with bread (or oatmeal), fat, syrup, and a few drops of aniseed, or in biscuit or other forms supplied by the well-known rat-destruction firms. *White squill is useless as a rat poison.* The dose of red squill necessary is 0.50 (male) and 0.27 (female) approximately, and the finely ground (the more finely ground the better) and completely dried bulbs only should be used. Domestic animals do not appear to find the red squill poison palatable, and, even if they partake, or are compelled to partake, of it, no serious poisonous ill-effects are to be anticipated. This is a very important consideration, coming from a Government department.

REFLEXES, HYPERPNŒA IN THE CLINICAL INVESTIGATION OF. (*See HYPERPNŒA.*)

RELAPSING FEVER. *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

An outbreak of relapsing fever in the Western Daur Province of Anglo-Egyptian Sudan has been recorded by D. Riding and T. W. Macdowell,¹ which is estimated to have carried off 10,000 out of 40,000 inhabitants. It appears to have spread down from the north-west, so is doubtless a continuation of the extensive epidemics of West Africa, as this area borders on the Lake Chad area of French Equatorial Africa. It resembled the European form of the disease in its course and in the large number of spirochaetes found in the blood of patients during fever, and the case mortality is believed to have been in the region of 75 per cent, while the survivors took six months to recover fully. E. J. Pampana² records two cases of relapsing fever simulating acute appendicitis, with tenderness in that region, and sickness. Fortunately, spirochaetes were found on examination of the blood in both, but he states that he now wonders whether some previous cases in which he had removed an innocent-looking appendix on account of urgent abdominal symptoms may not have been of a similar nature.

REFERENCES.—¹*Trans. Roy. Soc. Trop. Med. and Hyg.* 1927, April 27, 524; ²*Ibid.* Jan. 31, 357.

RENAL EFFICIENCY TESTS.*Hugh MacLean, M.D., D.Sc., F.R.C.P.*

Several papers on functional testing of the kidneys have appeared. Renal tests are now accepted in all countries and their value is being steadily appreciated. A good deal of discussion is still waged as to the best tests or combination of tests, but the general opinion appears to be that estimations of blood-urea, together with the urea concentration test, constitute the simplest combination by which the necessary information can be obtained. For ordinary use there can be no doubt that the urea concentration test proves the simplest means for investigating renal efficiency. This test can be carried out by any medical man in a few minutes, and no specially equipped laboratory is required. When carefully considered in relation to the clinical condition it will give all the information necessary. The general consensus of opinion now appears to be that the kidney functions all deteriorate together, so that various different tests designed with the view to testing different functions are unnecessary. When one test gives evidence of inefficiency, other tests, if sufficiently delicate, will do the same. For various papers on the subject of tests see A. M. Fishberg,¹ R. Coope and H. W. Jones,² J. H. Pratt,³ F. W. Hartman, A. Bolliger, and H. P. Doub,⁴ H. Blotner and R. Fitz,⁵ P. S. Hench and M. Aldrich,⁶ H. W. Jones and A. Cantarow,⁷ S. Kawahara.⁸

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1927, June, 202; ²*Brit. Med. Jour.* 1927, 1, 51; ³*Boston Med. and Surg. Jour.* 1926, July, 203; ⁴*Jour. Amer. Med. Assoc.* 1927, Jan., 139; ⁵*Ibid.* March, 985; ⁶*Arch. of Internal Med.* 1926, Oct., 474; ⁷*Ibid.* Nov., 582; ⁸*Ibid.* July, 30.

RENAL RICKETS. (See RICKETS, RENAL.)**RETINA, AFFECTIONS OF.***Lt.-Col. A. E. J. Lister, I.M.S. (retd.).*

Fulminating Blindness in Infants (Cécité Foudroyante).—A. Von Morax and Krehat¹ describe a most interesting case of a child 2 years old who in the course of a few hours became quite blind. Roughly, the picture seen ophthalmoscopically was similar to that of embolism of the central artery of the retina. Details must be sought in the original paper. Other observers have described similar cases, but they are rare. The authors conclude: There occurs among young children a special syndrome characterized by rapidly developing blindness and by alterations in the retinal circulation resembling the picture seen in embolism of the central artery of the retina, with this difference, however, that the pupils, in spite of mydriasis, preserve a certain degree of reaction to light. The condition is seen in hereditary syphilitics, and the affection is favourably and rapidly influenced by general Arsenical Treatment, which should be undertaken at once. In the case described, eight years old at the time of reporting, vision was $\frac{5}{10}$ and $\frac{1}{10}$ in the right and left eye respectively. There was a slight Wassermann reaction in the mother's case, and a history which pointed to hereditary syphilitic taint. There was evidence of chronic infection in the child's blood-count also. [The family doctor would certainly be the first to see such a case. If he could discover any history of syphilis, he would have, at any rate, some grounds for taking a cheerful view of such a case, which, in the absence of some knowledge of the occurrence of this condition, would be truly terrifying to parents and practitioner alike.—A. E. J. L.]

Treatment of Primary Detachment of Retina.—P. Bolle² has succeeded in curing 6 cases of primary detachment of the retina during the last six years without any recurrence, with no deterioration of vision, and without leaving any folds except in one very bad case. After attending to the general well-being of the patient, he is put to bed and made to lie on his back in as comfortable a position as possible, avoiding the strictly dorsal decubitus. The head is kept horizontal but allowed to incline to either side. The position it

is made to assume depends on the state of the detachment which is observed every three or four days ophthalmoscopically. As the position of the detachment alters, the head is correspondingly altered as regards its position. A pressure bandage is condemned as tending to lower tension and to damage the cornea. **Atropine Solution**, 1 to 2 per cent, is used to raise the tension as required. Subconjunctival injections of solution of pure sterilized **Chloride of Sodium** at a temperature of 39° are used. They are rendered painless by the injection of 5 per cent novocain, after the instillation of a few drops of 2 per cent cocaine solution. Two injections are given, one in the region of the detachment and the other exactly opposite to it. The injection in the region of the detachment is of a *weaker dilution* than the one given at the opposite position. Thus a solution of 2 to 4 per cent is given at the region of the detachment, and one of 6, 8, or 10 per cent at the opposite position. Not more than 1½ c.c. is given. The injections are followed immediately by hot compresses to promote absorption and osmosis. The author states that injections of sodium chloride by the ordinary methods in his experience have failed. The osmotic current set up is too weak. *The essential point in his treatment is the use of the two solutions of different strengths in the positions indicated.* The earlier the detachment, the greater the chance of success. After one month attempts at cure are useless, as the retina is devitalized and has lost its suppleness.

[Though the reviewer has seen success follow the older method of using sodium chloride subconjunctivally, it cannot be denied that both it and the many other methods of treating this condition leave very much to be desired. It is encouraging, therefore, to hear of one who has had such encouraging results even with six cases. The method presents no difficulties, and some will certainly feel inclined to try it in this truly desperate condition. As it seems to depend on osmosis, it would appear important to exclude cases in which there is a rent in the retina, as is not uncommonly the case.—A. E. J. L.]

REFERENCES.—¹*Ann. d'Oculist.* 1927, June, 401; ²*Schweiz. med. Woch.* (abstr. *Clinique Ophthalmol.* 1926, Nov., 627).

RHEUMATIC INFECTION IN CHILDHOOD.

Reginald Miller, M.D., F.R.C.P.

The rising tide of interest in the problem of juvenile rheumatism which was noted in last year's MEDICAL ANNUAL has shown no signs of subsiding this year. Three important reports on the subject have appeared, namely, the Medical Research Council's Report¹ (March, 1927), the second Report of the British Medical Association's Sub-committee of Inquiry on Rheumatic Heart Disease in Children² (April), and the Ministry of Health's Report³ (July). In addition to these, Carey Coombs⁴ devoted the first of his two important Chadwick Lectures to the rheumatic infection of childhood (March). To these may be added other papers, mentions in reports from M.O.H.'s and school M.O.'s. On the more practical side there is the opening of an important research unit of over 50 beds at Carshalton; the establishment of facilities in various parts of the country for rheumatic children requiring prolonged rest and care; and the establishment of clinics and centres for the stricter supervision and after-care of rheumatic children. Altogether it has been a year of commendable activity, and it is abundantly clear that we shall never go back to the comparative apathy in evidence until a short while ago.

The Report of the Medical Research Council was on "Social Conditions and Acute Rheumatism" in children, and thus covered some of the same ground as had been dealt with in the first of the two B.M.A. Reports⁵, namely the predisposing and environmental causes of the infection in children. As both

bodies of investigators were working entirely separately from each other it is interesting to compare the results obtained in the two reports, and this the reviewer attempted in a separate communication⁶. In it he claimed that the reports agreed on four important points: (1) That juvenile rheumatism is a disease of the poor and not of the well-to-do, yet notably it is not most common in the most poverty-stricken; (2) That the influence of heredity had in the past been over-estimated, and that it formed no invincible obstacle to prevention; (3) That the influence of attendance at school was less than the influence of the home environment; (4) That previous tonsillectomy modifies subsequent rheumatism. It is interesting to note that in the M.R.C. Report the same high prevalence of uncomplicated chorea was found in tonsillectomized children as had been observed in the first B.M.A. Report (*see MEDICAL ANNUAL*, 1927, p. 432). On this point Coombs⁴ has remarked that it takes a smaller dose of rheumatism to produce chorea in children of the right type than it does to originate any of the other manifestations of rheumatism.

On the other hand, on two points the two reports failed to confirm each other's results: (1) The M.R.C. Report made a prolonged study of the possibility of case-to-case infection in juvenile rheumatism, and although the results obtained showed no direct evidence in favour of it, the general impression left on the reader's mind is that such an explanation for the mass-production of rheumatism in the children of the poor is not impossible. The B.M.A. first report, although specially concerning itself in one section to the etiological factors of the disease, made no reference to the theory of direct contagion except to say that it was of no practical importance. (2) On another point of far greater importance the M.R.C. Report failed to confirm the conclusions of the B.M.A. Committee, namely, the influence of damp dwellings in the production of juvenile rheumatism. The M.R.C. Committee found damp homes were only slightly more frequent in the case of rheumatic families than in what they regarded as 'control families'. It is singularly unfortunate that in this very important matter the details of the work done should be open to criticism. This is not the place to engage in dispute, and therefore the writer will only repeat what he published in the *Lancet*⁶ on this point: "But with the 'control families' there is in the M.R.C. figures a large element of error, for the so-called 'control families' are by no means 'non-rheumatic families' . . . When the figures are examined it is found that in the 200 'control families' there were at least 43 cases of rheumatism, apparently spread over at least 36 of the families."

This brings up the question of what can be regarded as satisfactory 'controls' in sifting the evidence in rheumatic problems. It is not difficult, of course, to compare a group of rheumatic children with a group of children of similar age who are apparently free from rheumatic infection, but when this is done it is found that about 53 per cent of the control children have diseased tonsils, and it is therefore probable that an unknown proportion of these will develop the disease. When an effort is made to compare rheumatic *families* with non-rheumatic *families* the difficulties are increased. There is the difficulty in being sure that a family of children is really free of rheumatic infection, and there is the difficulty in the matter of tonsils already mentioned. In what way, then, can the influence of bad housing and damp be investigated by means of controls? It would seem that the method adopted by A. P. Thomson⁷ of making a rheumatic spot map of a district, although very laborious, is a trustworthy test. Examining the distribution of some 400 rheumatic cases in Birmingham he found that there were two areas of the city out of which the bulk of the rheumatism came. Both of these areas were damp and could be contrasted with two other areas of about equal poverty which were not so

damp and not so riddled with rheumatism. More of such spot maps in different districts are urgently needed.

The M.R.C. Report brought out one piece of evidence which was entirely new and of great importance. Examining the children and their medical records in residential Poor Law schools, it was found that they were practically free from rheumatic infection. Yet these children came from the rheumatic stratum of society, and it cannot well be doubted that if they had remained in their own homes many of them would have acquired rheumatism and heart disease. It is difficult to think of any factor, big enough to account for such a great difference, which had been altered in these children's lives, except the condition of the home itself, for it is known that excessive poverty and overcrowding do not themselves have a great influence on the production of the disease.

The Ministry of Health Report on "Acute Rheumatism in Children in its Relation to Heart Disease" gives a mass of information in small space on juvenile rheumatism, chiefly in its public health aspects. A note was made in last year's ANNUAL (p. 429) on the different estimates of the annual death-rate attributable to the disease by different investigators, ranging from 12,000 by Coombs⁵ to 30,000 by G. A. Allan⁶ and A. P. Thomson⁷. The Ministry of Health Report (p. 28) regards as safer the estimate of "25,000 deaths annually as due to heart disease of rheumatic origin in England and Wales, deaths moreover not occurring in the later age groups, but in those in which life is sweetest and most valuable." That is to say that 40 per cent of all deaths from heart disease are due to this preventable infection. To this account must be added, as Coombs has estimated, some five years of invalidism for each fatal case, thus giving us an idea of the ravages of the disease. The Report decides in favour of the value of Tonsillectomy in rheumatic children, and gives this decision with no uncertain voice. It advocates, further, the early and, of course, complete operation, stating that the results would be still better if the operation were done at an earlier date (p. 72).

F. J. Hector⁸ has studied the influence of scarlatina on the production and rekindling of rheumatism. One fact which emerged in a suggestive paper was of considerable interest, namely, that every patient who had had rheumatic infection previous to the attack of scarlatina, developed fresh rheumatism as the result of the scarlatinal infection.

REFERENCES.—¹*Med. Research Council Special Report Series*, No. 114; ²*Brit. Med. Jour.* 1927, II, Supp., 121; ³*Min. of Health. Rep. on Pub. Health and Med. Subjects*, No. 44; ⁴*Lancet*, 1927, I, 579; ⁵*Brit. Med. Jour.* 1926, II, Supp., 1; ⁶*Ibid.* 1927, I, May 28; ⁷*Birm. Med. Rev.* 1926, N.S., 255; ⁸*Glasgow Med. Jour.* 1924, 81; ⁹*Arch. Dis. in Childhood*, 1926, I, 339.

RHEUMATISM, ACUTE.

Ivor J. Davies, M.D.

T. T. Mackie,¹ from an analytical study of 393 cases of rheumatic fever and 89 cases of chorea, concludes: (1) Rheumatic fever in approximately 70 per cent of all cases, irrespective of age, presents itself as a chronic disease, characterized by periods of recurrence of the acute features—fever, arthritis, and leucocytosis. (2) The age of the patient is a highly important factor in the prognosis. This is evident from the fact that under the age of 15 years is found the highest incidence of first attacks, of cardiac involvement, and of liability to recurrence. (3) Serious cardiac involvement occurs in 68 per cent of cases irrespective of age. Between the ages of 10 and 15 years approximately 78.2 per cent of all cases present evidence of this complication in the first attack, and only after the age of 25 years does the incidence of heart disease fall below 50 per cent in the initial attack of rheumatic fever. (4) That focal infection plays a rôle in the etiology seems apparent from a comparison of its occurrence in the rheumatic cases, with a series of 400 non-rheumatic

controls. In the former group it was found in 80 per cent of individuals as against 66 per cent in the latter group. Tonsillar infection was found to be more than twice as prevalent in the rheumatic-fever cases as in 400 non-rheumatic controls. (5) The complete Removal of the Tonsils when evidence of infection is present, together with appropriate treatment of other foci of infection, seems to reduce but not to remove the incidence of recurrences of rheumatic fever. (6) The expected incidence of recurrences in all age groups was found to be 71 per cent. In patients above the age of 20 years at the time of the first attack of rheumatic fever, it was found to be 58.6 per cent, while below the age of 20 the incidence-rate was 78.2 per cent. (7) In a general way, the younger the patient at the time of the first attack of rheumatism, the greater is the probability of recurrence; 93 per cent of all cases where the first attack was between the fifth and tenth year have recurrences of the acute condition. (8) Only 57 per cent of the first recurrences were found to develop within a period of four years following the first attack of rheumatic fever. This would seem to be a very important factor in analysing the true worth of any therapeutic or prophylactic attack upon the problem of rheumatism.

F. J. Benjamin,² in the course of an investigation into the relation between social conditions and acute rheumatism in childhood carried out for the Medical Research Council, draws the following conclusions: (1) Rheumatism is a disease of poor people, and its incidence may well be in direct relation to the degree of poverty. (2) Rheumatism is very rare amongst children of the poor classes when they are placed in the splendid environment of Poor-law homes. (3) Once attacked, the poorer the child the worse the outlook. (4) The prognosis of cases with pericarditis and subcutaneous nodules is not so bad as is generally supposed. (5) Whilst unable to point with anything like certainty to any one factor of poverty associated with rheumatism, and whilst being as yet entirely in the dark as to its real etiology, it can be emphasized here, in the words of Dr. Still, that it is "by raising the standard of environment and improving the home conditions so that they approximate the well-ordered conditions found in such institutions as those in which rheumatism was found much less common, that we may hope to reduce the frequency of rheumatism in children".

W. H. Robey and L. M. Freedman³ have studied 454 cases to ascertain the effects of Tonsillectomy on the acute attack and recurrences of rheumatic fever. They believe that complete enucleation of the tonsils offers the best preventive of rheumatic fever, and therefore of rheumatic heart disease. They affirm that a history of repeated sore throats is of more importance than tonsils which appear to be diseased. This conclusion was also reached in the British Ministry of Health Report in 1924. Repeated sore throats, even with tonsils of normal appearance, call for tonsillectomy. Tonsils which are obviously diseased should be enucleated even in the absence of sore throats. The prompt subsidence of fever and joint symptoms following tonsillectomy in cases of acute rheumatic fever has much encouraged the above-named observers to resort to the operation as soon as they were convinced that the tonsil was the port of entry. It seemed to them that the danger of adding more cocci to a blood-stream already constantly carrying many of the micro-organisms was worthy of less consideration than some have given to it. They state that tonsillectomy is a major operation, and should be performed only by persons qualified by training and experience; also that incomplete removals leave the patient in as dangerous a situation as before, and throw discredit upon the value of tonsillectomy as a preventive. Tonsillar remains are often as formidable as the original tonsil.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1926, Aug., 199; ²*Lancet*, 1927, 1, 1175; ³*Boston Med. and Surg. Jour.* 1927, April 14, 595.

RHEUMATISM, ACUTE, IN CHILDREN, FROM A PUBLIC HEALTH STANDPOINT.

Joseph Priestley, B.A., M.D., D.P.H.

Investigations still continue and many valuable records are collecting. General insanitary conditions, undoubtedly, play a part—an indirect part—e.g., dampness and want of personal cleanliness. Medically, the whole subject is most interesting, and, from the point of view of the public health and the saving of life and ill-health, justifies the careful consideration of all medical officers of health and school medical officers. Chronic tonsillitis and enlarged tonsils predispose to the disease, but, on the other hand, even complete enucleation of the tonsils is not an absolute preventive. The value of preventive measures (including treatment) goes without saying, and the earlier such measures are taken, the better. Present hospital in-patient accommodation is inadequate for treatment and rest, whilst out-patient treatment in the ordinary homes of the patients is practically useless, because of the complete absence of rest, which is so necessary—controlled rest, as it is medically called.

The inter-relationship between acute rheumatism and damp houses is still under consideration. The Architects' Association is collecting statistics as to the number of houses that are damp in fact. The result of this inquiry will be awaited with interest, and the old discussion will probably again be raised as to damp-courses—their natures and values. Speaking generally, a damp-proof course, efficiently constructed (vertical or horizontal or both, as required), effects what it is intended to effect. Unfortunately, however, there are damp-proof courses and damp-proof courses. This is the question upon which the Architects Association's report will be of great value, if treated from a *practical* point of view. There should be no relaxation of the principle of the need for such damp-proof courses in all cases. The only question is the best and most efficient means of carrying out the work practically, more especially the combination of the vertical with the horizontal damp-course. It is common knowledge that horizontal damp-proof courses are at times provided, and that earth is allowed to be banked against the walls of living rooms above the levels of such horizontal damp-proof courses!

RHINITIS, ATROPHIC.

A. J. M. Wright, M.B., F.R.C.S.

This condition is still the bugbear of the rhinologist, and, up to the present, treatment has had to be entirely symptomatic. Provided that the discharge can be kept from drying into crusts, the offensive odour, which is the most distressing symptom of the disease, can be avoided. The two methods here described, designed to attain this end, would seem worthy of trial. Ludwig Soyka¹ uses Powdered Quillaia Bark insufflated into the nose once daily. This, by its irritation, produces a profuse watery discharge, and the nasal mucosa remains moist for the rest of the day. The crusts should be removed before the insufflation, and he claims that he has obtained cures in several cases by some weeks of this treatment. Benjamin Frendenfall and Simon Stein² suggest the use of a Plug of rubber bath sponge for the same purpose. A piece about the size of an almond is inserted within the nostrils and left in place for one hour on rising in the morning and for a similar period before going to bed. On removal of the plugs the nose is sprayed with Saline. The sponge plugs act partly as an irritant and partly by cutting off the air and therefore diminishing drying. E. Escat³ regards atrophic rhinitis as a syndrome and not as a disease. As a result of a careful study of individual cases and their relatives he believes that more than half the cases are due to hereditary syphilis. The atrophy results from a suppurative rhinitis in infancy. The Wassermann reaction is frequently negative in these cases, the active stage of the syphilitic disease being over.

REFERENCES.—¹*Zeits. f. Hals, &c.* xiv, pt. 1, 256; ²*Laryngoscope*, 1927, April; ³*Oto-rhino-laryngol.* 1926, May, 193.

RHINORRHEA.

1. J. M. Wright, M.B., F.R.C.S.

A watery discharge from the nose occurs in two classes of case: the rare condition, *cerebrospinal rhinorrhœa*, in which cerebrospinal fluid is discharged from the nose; and *nasal rhinorrhœa* in which the discharge comes from the nasal mucous membrane and is due either to an inflammatory lesion, a vasomotor defect, or a combination of the two.

Cerebrospinal Rhinorrhœa.—In a review of cerebrospinal rhinorrhœa, W. H. Johnstone¹ points out that a necessary condition is a connection between the brain and the nose. This opening may be produced by a variety of conditions, such as fracture of the base of the skull, sinus disease, intracranial tumour, or the rupture of congenital meningocele. In the majority of cases increased intracranial pressure is present. James Barrett² records a case in which the symptom was due to bilateral tumours of the auditory nerves. The diagnosis is based on the escape from one nostril, usually the left, of fluid which, on drying, does not stiffen linen and which appears and disappears suddenly. The fluid reduces Fehling's solution, and if 1 c.c. of fluorescein is injected into the spinal canal, it is discharged from the nose.

Vasomotor Rhinitis.—This is one of the names by which an ill-defined group of conditions is known which are characterized by watery discharge, sneezing, etc. In all cases some degree of sensitiveness or allergy is present, in addition to some other exciting cause of the attacks. G. M. Coates³ rightly points out that pallor of the nasal mucous membrane is a constant characteristic in this disease. A thorough and exhaustive examination of the patient, from every point of view, is essential in trying to identify the exciting cause. In many cases an infective focus is present in the nose or nasal sinuses, and, after operation on these, an autogenous Vaccine should be employed to overcome the sensitization.

REFERENCES.—¹*Ann. of Otol. Rhinol. and Laryngol.* 1926, xxxv, 1205; ²*Med. Jour. of Australia*, 1926, Aug. 7, 182; ³*Ann. of Otol. Rhinol. and Laryngol.* 1926, xxxv, 723.

RHIZOTOMY FOR PAIN IN INOPERABLE CARCINOMA.

Geoffrey Jefferson, M.S., F.R.C.S.

Division of posterior spinal nerve-roots for tabetic and post-herpetic neuralgia is one of the established operations of surgery, though it has been largely superseded by the much more certain manœuvre of division of the spinothalamic tracts. This latter operation produces in suitable cases instantaneous relief from pain and is one of the most successful imaginable. The writer has found it all that its originators (Spiller and Frazier) claim for it, but it can only be safely applied where the pain arises in the abdomen, pelvis, or lower limbs. Division of the tract in the neck is not yet an operation of perfect safety and precision, although it has been done.

For pain about the shoulders and in the neck we still must have recourse to posterior root section. Temple Fay¹ has performed these sections for the pain of inoperable glandular metastases in the neck secondary to malignant ulcers of the mouth. Philadelphia has always been to the fore in designing methods of relief for these patients, who become very rapidly demoralized by the unceasing pain, pain which drugs only dull temporarily but never dismiss completely. Nerve section is a perfectly rational and humane treatment, but no doubt many practitioners refrain from recommending it to their patients, as they visualize the operation as one of considerable severity, and one not likely to be survived by a pain-worn creature. This is far from being the case, for modern neurological surgery is not the lethal business it was years ago, and the immediate mortality would seem to those educated many years ago surprisingly low. For this we have to thank two operative refinements in

technique—perfect hæmostasis at all stages of the operation, and the use of novocain-adrenalin as the agent or adjunct of anæsthesia. [Personally, the reviewer never operates under local anæsthesia without a skilled anæsthetist, for his presence and the knowledge that ether will be administered at any painful stage has a wonderfully steadying effect on the patient.]

Fay describes three cases in which he ligatured the upper three or four cervical roots for intolerable pain in the neck due to malignant glands. He exposed the posterior half of the foramen magnum and removed the lamina of the upper four cervical vertebræ under novocain. After the dura had been incised, ether was administered and the roots were tied tightly. This method of tying the roots, perhaps after carefully crushing them instead of cutting them, was introduced by Frazier to obviate the hæmorrhage from the small arteries accompanying the roots. The nerve filaments must be tied with fine silk. The choice of method will vary with individuals; there is nothing to choose between them save that the simple ligature is slightly the easier. The most perfect hæmostasis is essential, and the utmost gentleness; for a not long delayed fatality is the natural outcome of contusion or oozing at this high level of the cord. All of Fay's cases made good recoveries, and one was able to return to his work as a farmer.

In a more recent case Fay has returned to this question in a paper of the first importance. He has evidently found that whilst pain in the neck and up over the occiput from involvement of the cervical plexus is cured, the pain in the throat which is so common a complaint has remained unaffected. The reviewer had a similar experience when a man had an epithelioma of the right anterior faucial pillar cured by radium, but intolerable pain in the tongue, jaw, and throat continued. An intracranial resection of the second and third divisions of the trigeminal with fractional resection of the root was done, with relief of all pain save that in the throat. This pain might be due to involvement of one of two nerves, glossopharyngeal or vagus. In Fay's first case, of the second series, he divided first the second and third cervical posterior roots and also the glossopharyngeal by the intracranial route as devised by Adson. This failed to cure the pain in the throat and ear, so a month later he divided the sensory root of the trigeminus. The pain referred to remained unabated, though pains in other parts of the head and neck were ended. It is of supreme interest to note that the section of the glossopharyngeus caused no anæsthesia save that of the special sense of taste. The swallowing reflex was not lost, and tactile sense remained as before in the pharyngeal wall. These observations, which were most carefully made, seemed to localize the pain conduction path to the vagus. Accordingly, in his next case, Fay decided to divide the vagus intracranially. The patient, a male, age 48, was suffering from inoperable carcinoma of the tongue with glandular metastasis in the neck. He had severe pain in the ear, throat, lower jaw, and tongue. Fay divided the sensory root of the trigeminus, with cessation of pain in the tongue and jaw. There was no relief of pain in the throat or ear. A fortnight later, therefore, Fay performed a suboccipital craniectomy under local anæsthesia, and lifting the cerebellar hemisphere to the side he divided the fibres of the vagus. During the sectioning the pulse dropped to 40, but otherwise there were no untoward happenings. All pain was instantly relieved. Study of the anæsthetic areas produced showed an addition to the already existing patch in the ear which resulted from the trigeminal operation. In addition there was a small isolated patch in the hollow immediately in front of the mastoid process. Turning to the throat, the soft palate was seen to be paralysed, there was difficulty in swallowing, and the vocal cords were palsied. The patient tended to choke with small draughts of water, and unhappily choked himself thus four days after and died.

It appears therefore that the distressing throat and ear pain suffered by these inoperable cancer patients is of vagal origin, and not glossopharyngeal or trigeminal. Pain in the tongue and jaws can be readily stopped by section of the last named; so much is certain. In section of the vagus we seem to have the cure of the other pain, but one wonders whether it is going to be widely applicable. Palsy of a vocal cord alone is not likely to cause death; it is not infrequent after thyroid operations and, though troublesome, it is not fatal when unilateral, of course. It seems that the pharyngeal paralysis and anæsthesia must have been the deciding factor in Fay's case; but, short of choking, the tendency to inhalation pneumonia must be great. Further experience must be awaited or, better, sought.

REFERENCES.—¹'Cervical Rhizotomy for Pain in Carcinoma of the Neck,' *Surg. Gynecol. and Obst.* 1926, Aug., 366; and 'Observations and Results from Intracranial Section of the Glossopharyngeal and Vagus Nerves in Man', *Jour. Neurol. and Psychopathol.* 1927, Oct., 110.

RIB, CERVICAL.

A. W. Adson and J. R. Coffey¹ describe a *method of anterior approach for relief of symptoms by division of the scalenus anticus*. Surgical treatment, they say, should be considered: (1) If the patient complains of pronounced pain or of sensory or circulatory disturbance sufficient to incapacitate him; (2) If he presents evidence of atrophy in the arm or hand of the affected side; (3) If there is evidence of circulatory disturbance on the affected side, especially if the pulse at the wrist can be obliterated or markedly reduced by extending the neck or rotating the head, even though the brachial symptoms are only slight.

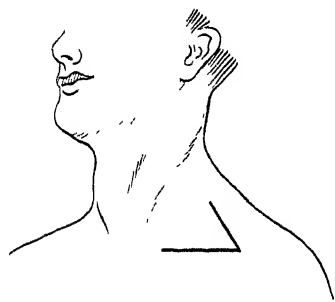


Fig. 77.—Wheeler's incision for removal of first rib.

Sir W. I. de C. Wheeler, *F.R.C.S.I.*

[The reviewer,² in dealing with compression neuritis due to the normal first dorsal rib, recommended an incision (Fig. 77) as if for ligature of the subclavian artery. A second limb was added, running parallel to the fibres of the trapezius muscle. The

brachial nerve-trunks were retracted forwards and downwards, and the interval between the scalenus medius and levator anguli scapulae muscles defined. The attachment of the former muscle to the first rib was divided subperiosteally, and the inner border of the bone cleared of periosteum and Sibson's fascia. It was found very difficult to get far enough forward by dissection from behind, and in consequence, when the rib was defined, the nerves and other structures were retracted backward in order to clear the bone between the artery and the lower brachial trunk. The rib was then divided in front of the groove which is supposed to carry the subclavian artery. The subclavian artery does often lie in direct contact with the rib; but in the case under discussion, i.e., compression neuritis in the absence of cervical rib, the nerve lies tightly stretched like a band across the inner border of the first rib.—W. I. de C. W.]

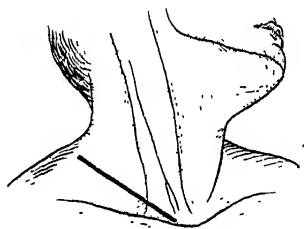


Fig. 78.—Adson and Coffey's incision for cervical rib. (Figs. 78-80 re-drawn from 'Annals of Surgery'.)

Adson and Coffey state that a cervical rib has generally been removed by the

mid-cervical or post-brachial approach. They think that this procedure involves the most traction on the nerve-trunks. They recommend an incision as shown in *Fig. 78*, which extends forward over the sternoclavicular articulation. After division of the omohyoid muscle the dissection is carried upwards into the lower border of the posterior triangle. Prior to the removal of the cervical rib, tenotomy is performed on the scalenus anticus tendon at its attachment, permitting it to retract and to be elevated for exposure of the subclavian artery in the supraclavicular triangle (*Fig. 79*). In the transcervical or the post-brachial approach, the surgeon is usually content with elevating the brachial plexus and removing the rib, or as much of it as is possible, from behind, without exposing the scalenus anticus muscle, the subclavian artery, or other tissues in front. Because of the occasional post-operative palsy which ensued and the greater ease in operation. one of the authors (Adson) was

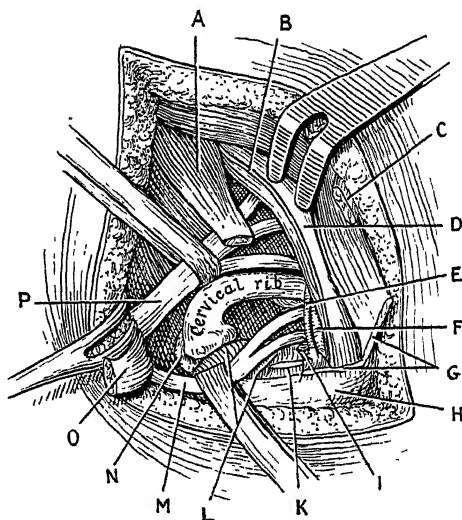


Fig. 79.—The anterior approach to the cervical rib when resection is advisable. A, Anterior scalenus muscle; B, Phrenic nerve; C, Omohyoid; D, Jugular vein; E, Inferior thyroid artery; F, Vertebral artery; G, Sternocleidomastoid; H, Clavicle; I, Transverse cervical artery; K, Anterior scalenus; L, Subclavian artery; M, Lower trunk; N, First thoracic rib; O, Omohyoid; P, Upper trunk.

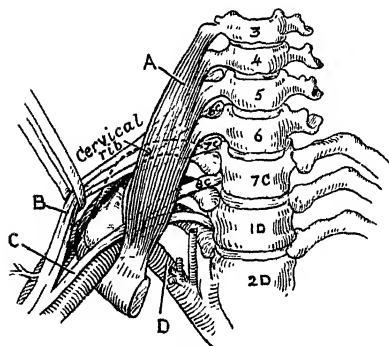


Fig. 80.—Illustrating not only compression of the subclavian artery and the lower trunk, but irritation of the entire brachial plexus, by the scalenus anticus against the completely formed cervical rib. A, Anterior scalenus muscle; B, Upper and middle trunks; C, Lower trunk; D, Subclavian artery

persuaded to use, and subsequently to adopt, the anterior approach, in which the clavicular attachment of the sternocleidomastoid muscle is reflected to expose the scalenus anticus muscle, the subclavian artery, and the brachial plexus. One can readily observe the pressure produced by the scalenus anticus muscle when the neck is extended backward or the head is rotated toward the affected side (*Fig. 80*).

After having removed several ribs according to this technique, and having studied the mechanics which produce the symptoms, they were convinced that, with the exception of one case, removal of the cervical rib was really unnecessary, inasmuch as the subclavian artery and the brachial plexus were immediately relieved from pressure and irritation upon severance of the scalenus anticus muscle from its insertion. The latter procedure was much less difficult and more effective, since the subclavian artery was then permitted to recede

and take on its normal size, provided operative treatment was instituted before any permanent change had taken place. All traction on the brachial plexus is removed by the tenotomy of the scalenus anticus muscle. The ulnar nerve rides over a bony prominence where it is constantly subjected to motion without symptoms being provoked; there should be no more likelihood of symptoms arising in the brachial plexus when it merely lies on the cervical rib, with little or no motion and no traction on it. Accordingly, they have operated on four patients by means of the anterior approach, dividing the tendinous attachment of the scalenus anticus muscle without removing the cervical rib; symptoms were completely relieved.

Adson and Coffey conclude a most instructive paper by saying: "The results have been as good following simple division of the scalenus anticus muscle as they were after removal of the cervical rib, and trauma to the brachial plexus was avoided. Therefore, we feel justified in advocating the anterior approach and division of the scalenus anticus muscle without removal of the cervical rib. (1) In about 55 per cent of the cases reviewed in our series, the cervical ribs were symptomless. (2) Patients with cervical ribs without symptoms should not be informed of the accidental finding, as this may give rise to neurosis with symptoms referable to the rib. (3) The surgical indications depend directly on the degree and the type of the incapacity produced by the presence of pain, hyperesthesia, anesthesia, and circulatory disturbance. Surgical treatment should not be advised for mild, indefinite pain in the neck and shoulder. (4) The anterior approach and tenotomy of the scalenus anticus muscle are preferable to the transevercal approach and resection of the cervical rib, since the same relief is offered, the procedure is less formidable, and post-operative numbness in the arm and palsy of the brachial plexus are avoided."

W. M. Brickner,³ dealing with *pressure produced by the normal first rib*, says there are cases of pain in the arm, with paræsthesias and other phenomena, that are relieved by elevating the shoulder and by exercising the trapezius to keep it elevated. These cases, of which three are reported, are probably due to dragging of the brachial plexus over the first rib. There are more severe cases in which all the phenomena of pressure by a cervical rib are produced by the pressure of an abnormal or even a normal first thoracic rib. Several have been cured by resection of the first rib. The technique of the operation is described. When operating upon a case of cervical rib, it is important to observe whether the pressure to be relieved is due to this supernumerary, or to the normal first, rib. Two cases are reported of intermittent severe pain and œdema in one upper extremity, occurring in adolescent females and perhaps due to plexus pressure by the first rib. He also recommends division of the scalenus anticus muscle in order to obtain more room.

[In one case under the care of the reviewer⁴ the signs and symptoms of compression neuritis were very clear, but the patient was not relieved by removal of a portion of the first rib, or by persistent conservative treatment beforehand. In this case it was found that the interossei muscles were practically non-existent, and that there was weakness in the median distribution, as shown by the poor attempts to flex the first finger. An inability to extend the wrist and fingers fully pointed at the same time to involvement of the musculospiral nerve. Generally speaking, the appearance of the hand suggested a mild variety of *main en griffe*. Loss of power was most marked in the area supplied by the ulnar nerve. Sensation appeared normal, except in the ring and little finger, and here it was only slightly altered. He could not tell degrees of heat and cold with the same facility as when the test was applied to the normal hand, and he could appreciate light touches better than pinpricks. Pain, but

for the initial cramps some years previously, had been conspicuous by its absence, and in this respect his case differed from others recorded. X-ray photographs demonstrated the absence of cervical rib, and showed a normal thoracic inlet.

During the examination the patient made a statement of great interest, with direct bearing on his condition. He said that the gripping power of his fingers depended greatly on the position of the arm. Above his head his power was greatly increased, and he could write on a blackboard steadily and with ease. Grasping a tea-cup, on the other hand, was almost impossible. On giving him a pen and paper he wrote his name like a man suffering from paralysis agitans: but when the paper was put on the wall above his head the writing was clear and steady.

Treatment by massage, ionization, hot-air baths, etc., was tried for several months. Special attention was given to the upper fibres of the trapezius, in the hope of increasing the support of the pectoral girdle upwards.—W. I. de C. W.]

REFERENCES.—¹*Ann. of Surg.* 1927, June, 839; ²*Dublin Jour. Med. Sci.* 1920, April; ³*Ann. of Surg.* 1927, June, 858; ⁴*Practitioner*, 1920, June.

RICKETS.

Reginald Miller, M.D., F.R.C.P.

PROPHYLACTIC TREATMENT.—The possibility of influencing the child by treatment of the mother during pregnancy and lactation is still being extensively studied. Carrying the principle of Irradiation of foodstuffs a step further, observers in America have been experimenting with the milk of women subjected to irradiation, and A. F. Hess, M. Weinstock, and E. Sherman¹ have demonstrated the presence of a definitely antirachitic property in the milk of such women as compared with that of untreated women, in a series of experiments on rats previously rendered rickety by deprivation of phosphorus. The work is suggestive as far as it goes, but does not seem to indicate any immediate displacement of the simpler and more direct forms of prophylactic treatment. It has already been pointed out that irradiation has its drawbacks and can be overdone; milk exposed for no longer than five minutes becomes unpalatable by developing an unpleasant smell, and undergoes chemical changes, including oxidation and destruction of the vitamin A. The prophylactic treatment of rickets by administration of Cod-liver Oil to the lactating mother has also been the subject of study, chiefly in America, and A. A. Weech,² who treated groups of women with varying amounts of cod-liver oil during lactation and compared the incidence and severity of rickets in their infants, found that this method was to some extent efficacious, though less than the direct method of administering the oil to the baby.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1927, Jan. 1, 24; ²*Bull. Johns Hop. Hosp.* 1927, April, 244.

RICKETS, LATE.

Reginald Miller, M.D., F.R.C.P.

For many years there have been described instances in which bony changes, simulating those of rickets, have developed for the first time at an age far later than the usual one for rickets. From this fact such cases have been classed as 'late' or 'delayed' rickets. Our knowledge as to their significance has been vague, and indeed whether they are properly called 'rickets' at all has been uncertain. Probably there are many types of case classed together in this group; of them the most clearly recognized are cases associated with coeliac disease and with that congenital or early form of chronic nephritis which leads to 'renal infantilism'. During the past year there have been important researches published on both these conditions, now termed 'renal rickets' and 'coeliac rickets' (see RICKETS, RENAL; and COELIAC DISEASE).

RICKETS, RENAL.*Reginald Miller, M.D., F.R.C.P.*

Renal infantilism is a condition which has now been recognized many years. Renal disease in this class of case is either present at birth or develops in very early life: polyuria, polydipsia, enuresis, retarded growth and development, and sometimes, but not invariably, cardiovascular changes, are the prominent symptoms. With these there has been noticed almost constantly a considerable degree of knock-knee, and in the last few years cases have been found in which the bone changes were far more extensive than this, and these have given rise to the term 'renal rickets.' This state has been studied lately by L. Parsons¹ and E. P. Brockman.² Both these authors, working independently, conclude that the bone changes are those of rickets, and both note the bad prognosis in the condition, its lack of successful response to either medical or surgical treatment. This is hardly to be wondered at, as renal infantilism is itself incompatible with adult life, most cases dying before the age of fourteen is reached.

REFERENCES.—¹*Arch. Dis. in Childhood*, 1927, ii, 1; ²*Brit. Jour. Surg.* 1927, April, 643.

RINGWORM. (*See SKIN, FUNGUS INFECTIONS OF.*)**RUBELLA.***J. D. Rolleston, M.D.*

SYMPTOMS AND COMPLICATIONS.—P. Leitner¹ records a severe outbreak of rubella which occurred at Cluj, in Roumania, in the spring of 1924. There were in all about 60 cases, 20 of which he was able to study closely. Like Heubner, Lust, Salge, and others, he found that the incubation period was exactly 17 days, and during this time the disease was not contagious. Theodor's sign, i.e., swelling of the cervical glands, occurred in a very large number of the cases, and almost always 8 to 10 days before the eruption, and in severe cases did not subside until 4 to 6 weeks after the eruption had faded. The severity of the disease was shown by its almost always setting in with a temperature ranging from 102.2° to 104° which persisted for several days, a normal level being reached in 8 to 12 days. In most cases the eruption lasted 8 to 10 days; in some instances traces could still be detected as brownish pigmented spots 3 to 4 weeks later. The eruption was present not only on the skin but also on the mucous membranes, in the form of a severe and obstinate conjunctivitis, and well-marked redness of the buccal mucosa and palate, as well as of the posterior pharyngeal wall, which gave rise to a troublesome hacking cough. The nasal mucosa was never affected. The prognosis was invariably good. All Leitner's patients recovered. In one case, however, the attack of rubella seemed to rouse a hitherto dormant glandular tuberculosis into activity.

P. Zadik² records a severe attack of rubella in a boy, age 4, characterized by a sudden onset with a temperature of 104°, vomiting, delirium, and meningeal signs. The following morning the temperature became normal, and the meningeal symptoms disappeared, but on the third day the temperature rose again and the child showed the typical eruption of rubella. The unknown virus of rubella seems to have caused some toxic irritation of the meninges in this case.

[The occurrence of meningeal symptoms in rubella has also been reported by Bénard (*see MEDICAL ANNUAL*, 1923, p. 405), but is very rare.—J. D. R.]

REFERENCES.—¹*Jahrb. f. Kinderheilk.* 1926, cxiv, 209; ²*Deut. med. Woch.* 1927, 412.

SALPINGITIS. (*See PELVIC INFECTION.*)

SCARLET FEVER.*J. D. Rolleston, M.D.*

EPIDEMIOLOGY.—W. Chodzko¹ gives the following account of the epidemic of scarlet fever in 1926 at Warsaw, where the disease was as severe as it was in London fifty years ago. It reached its height much sooner than the epidemic of 1925, as the permanent increase in the number of cases took place in April instead of in August as in 1925. The case mortality for the first thirty-seven weeks of 1926 was 13 per cent, as compared with 10·33 per cent for the period 1920–24 and 11·5 per cent for 1925. More than 60 per cent of the children affected were under five years of age, whereas normally the percentage of children of pre-school age in Warsaw who contract scarlet fever does not exceed 33 or 34.

In a discussion at the Royal Society of Medicine on the serum treatment of scarlet fever, J. D. Rolleston² remarked that during the period 1874–79, shortly after the hospitals of the Metropolitan Asylums Board had been established, the case mortality of scarlet fever in these hospitals was 13·9 per cent, or the same as that in Warsaw in 1926. During the following years the case mortality in London gradually declined. In the period 1890–94 it fell to 6 per cent, and in 1900 it was 3 per cent, in 1925 1·1 per cent, and in 1926 0·8 per cent.³ It therefore seemed that scarlet fever in London now, as when it was first described in 1675, was hardly worthy of the name of a disease. It was, however, more severe in Scotland, but it was particularly malignant in South-east Europe, especially Bulgaria and Roumania.

P. M. Holst⁴ brings forward statistics showing that isolation of scarlet fever has not materially diminished the frequency of the disease, whereas the abolishment of isolation at Bergen and Trondhjem has had no bad effects. He concludes that there is no substantial reason for continuing the routine isolation of scarlet fever, which at present is milder than measles and whooping-cough. On the other hand, in the recent report of the Ministry of Health⁵ it is recommended that the following patients should be selected for hospital treatment; severe cases not too ill to be removed, cases occurring in houses where other members of the family are engaged in milk-selling, clothes-making, etc., or there are many susceptible children, or there are no means of adequate nursing at home. According to the Ministry of Health there is no good reason for prescribing a routine period of detention in hospital of more than four weeks in uncomplicated cases, and in other cases the period should be based on the patient's general clinical condition.

ETIOLOGY.—The following observations carried out independently by German and American observers are of interest in connection with the duration of the infectivity of scarlet fever. U. Friedemann and H. Deicher⁶ found that scarlatinal streptococci were present only in the patients' throats and the pus of septic complications. The scales and urine contained no streptococci, and were therefore not contagious. Scarlatinal streptococci were found in large quantities in the patient's environment, including the walls of the room, beds, curtains, and toilet articles. A thorough terminal disinfection therefore in scarlet fever, which some health authorities have recently been discarding, appears to be necessary. Scarlatinal streptococci were found in the tonsils of 100 per cent of convalescents discharged after six weeks' stay in hospital, so that the writers regard the erection of airy huts as necessary for scarlet fever convalescents.

In a subsequent paper,⁷ Friedemann and Deicher state that investigations on a small scale on isolated cases of scarlet fever nursed at home showed that the patients lost their streptococci in the third and fourth weeks—in other words, became free of infection much earlier than cases treated in hospital. They also point out that though the diagnosis of scarlet fever cannot be made

by bacteriological examination, as we do not possess any simple method for distinguishing scarlatinal streptococci from other hæmolytic streptococci. bacteriological examination of the throat in convalescence is of great importance, as it is the best means of determining when a patient is free from infection, it being safe to assume that all hæmolytic streptococci found in the throat of convalescents are scarlatinal streptococci. E. E. Nicholls⁸ cultivated the throats of 40 scarlet fever patients, from 2 to 48 years old, suffering from all types of the disease, and found that in every case *Streptococcus scarlatine* was present in the throat cultures at the end of the third week. There seemed to be little diminution in the degree of throat infection, as judged by the amount of growth, irrespective of the severity of the case, the use of antitoxin, or the presence of complications.

SYMPTOMS AND COMPLICATIONS.—B. R. Lovett⁹ states that *scarlet fever following operations on the nose and throat* is a not infrequent form of surgical scarlatina. The patient may be infected by the operator or instruments, or he may harbour the organisms in the nose or throat previously, but resist their invasion until an operation allows them to enter the tissues in large numbers, or the operation may facilitate infection from outside either by a person suffering from actual scarlet fever or a carrier of streptococci. Of 48 cases classed as surgical scarlet fever at the Durand Hospital, Chicago, from 1902 to 1926, 26 followed operations, 13 of which were on the nose and throat. Of these, 7 were operations for cleft palate, 2 resections of nasal septum, and 4 tonsillectomies. The interval between the operation and the first symptoms of scarlet fever ranged from two to four days. All the patients had typical scarlet fever, and most were of the septic type. Complications were unusually numerous. In most of the cleft-palate cases, sloughing of the tissues and imperfect closure of the defect occurred. One patient operated on for cleft palate and hare-lip died.

H. L. Higgins and W. J. Graf,¹⁰ who record an illustrative case, remark that *anuria* in scarlatinal nephritis is rare. In Dunham's case the anuria lasted fifty-one hours, with recovery. Ker has reported a case which also recovered after complete suppression of urine for five days. In Pisano's case no urine was excreted for ten days, but there was abundant sweating. There was no œdema. When urine was passed again it contained blood and albumin. Recovery was rapid. There are several cases of post-scarlatinal anuria on record in which the urine before and after the anuria seemed normal and contained no albumin or blood. In the present case, which occurred in a girl of 3, nephritis set in on the sixth day of scarlet fever. Anuria, which developed at once, lasted seven and a quarter days, and was not accompanied by any symptoms of uræmia. Treatment consisted in intravenous injections of **Hypertonic Solutions** (glucose 40 per cent, magnesium sulphate 2 per cent, and calcium chloride 0.2 per cent) to reduce the œdema presumably present in the kidney. The function of the kidney was being restored until streptococcus septicæmia caused suppurative otitis media, empyema, and death.

J. G. Forbes¹¹ records a case of *post-scarlatinal meningitis* which is remarkable as being the first on record in which *Streptococcus scarlatine* has been isolated from the cerebrospinal fluid. The patient was a girl, age 6 years, who, eleven weeks after a sharp attack of scarlet fever in which there had been no evidence of ear trouble, developed symptoms of meningitis. A very turbid cerebrospinal fluid showing marked polymorphonucleosis and some streptococci was withdrawn by lumbar puncture. The patient died twelve hours after the onset of meningeal symptoms without having shown clinical evidence of middle-ear or sinus infection. There was no autopsy, so that it could not be determined whether the meningitis was a primary septicæmic phenomenon or

PLATE XXIX

THE DICK TEST FOR SCARLET FEVER

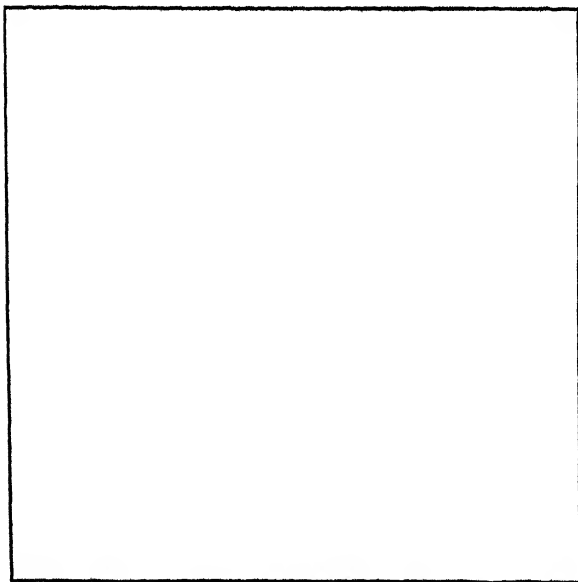


Fig. A.—The reaction on the third day of scarlet fever.

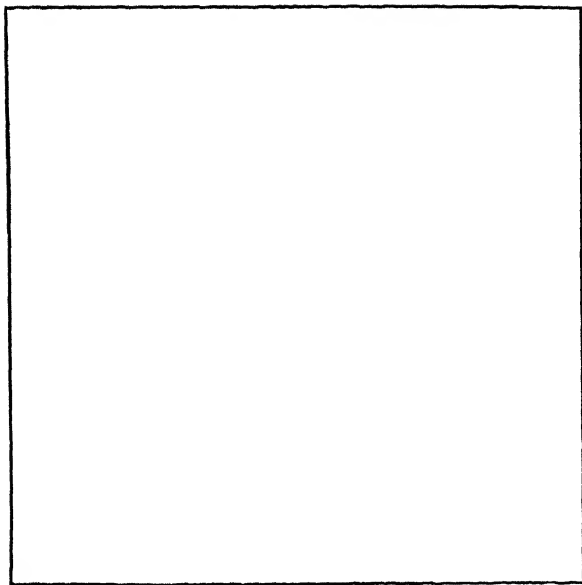


Fig. B.—The reaction in a non-scarlatinal case susceptible to the disease.

secondary to otitis. Cultures of the streptococcus showed that the organism was identical with one of the strains isolated by Dochez in association with scarlet fever, and, moreover, the only homologue of the Dochez strain so far found in this country. Forbes quotes the following passage from the reviewer's text-book: "Suppurative meningitis in scarlet fever is almost always secondary to otitis, rhinitis, or arthritis, but there are about eight cases on record of primary suppurative meningitis".

Another case of post-scarlatinal meningitis due to *Str. scarlatinae*, in which recovery took place, has since been recorded by J. B. Neal and A. Jones.¹² The patient was a girl, age 7 years, who developed meningitis on the fifth day of a mild attack of scarlet fever complicated by left otitis. Sixty c.c. of purulent cerebrospinal fluid under greatly increased pressure were withdrawn, showing a considerable increase in cells, practically all polymorphonuclears, as well as growth of *Str. scarlatinae*. Treatment consisted in injection of scarlet fever Antitoxin intramuscularly, intraspinally, and by cistern puncture.

Haken,¹³ who reports three personal cases of *optic neuritis* in scarlet fever, illustrates the rarity of this condition, of which the reviewer has never seen an example, by the fact that Groenow could find only 8 on record. Among 253 cases of optic neuritis occurring in infectious diseases, Uhthoff found that only 3 were due to scarlet fever. In Barlow's case there were symptoms of nephritis, and in Betke's patient there was evidence of meningitis, but none of the rest had any other complications. Of the 8 cases, 2 recovered, 2 showed considerable improvement, and 1 ended in optic atrophy. Of Haken's cases, two were in women, age 21 and 25 respectively, and one was in a man, age 36. In all three cases the attack of scarlet fever was severe and complicated by myocarditis, but none had any albuminuria. Visual capacity and perception of colour were considerably diminished in all. Complete recovery took place in two or three weeks. In one case meningitis could not be excluded. The sinuses in all the cases were intact.

H. Audeoud¹⁴ reports a case of *cancerum oris* which followed an unrecognized attack of scarlet fever nine weeks previously. There were gangrene of the upper gum margin and necrosis of the upper jaw, while in the lower jaw only the right portion of the bone was involved. The cheeks, palate, and pharynx were not affected. Cultures of the lesions yielded streptococci and staphylococci only, and no Vincent's or Schimmelbusch's organisms were discovered. Under local treatment with Novarsol, Potassium Permanganate, and tincture of Iodine, accompanied by subcutaneous injections of Collargol, Camphor Oil, and Strychnine, gradual improvement took place, but the child lost sixteen of his milk teeth and an indefinite number of the permanent set. Recovery finally ensued, but considerable deformity of the gums resulted.

F. R. Curtis and I. C. Thomson¹⁵ report a fatal case of septic scarlet fever in a girl, age 6 years, complicated by *surgical emphysema*. No previous example of this complication has been recorded in scarlet fever. There was no suggestion of gas gangrene, but a bacteriological examination was not made.

THE DICK TEST.—According as it is positive or negative the Dick test indicates whether an individual is susceptible or immune to scarlet fever. A positive reaction is shown by the appearance from four to six hours after intracutaneous injection of the toxic filtrate of *Streptococcus scarlatinae* of a small circular erythematous area which reaches its maximum in 18 to 36 hours after injection and then rapidly fades, rarely leaving either pigmentation or desquamation. The test is positive: (1) In from 70 to 100 per cent of scarlet fever patients in the first three days of the disease (*Plate XXIX, Fig. A*), and then tends to become negative; (2) In non-scarlatinal cases who are susceptible to the disease (*Fig. B*).

From observations on 7431 cases, J. von Bokay¹⁶ is fully convinced of the accuracy of the work of the Dicks. He considers that there is a very close relationship between the result of the Dick test and susceptibility to scarlet fever, and therefore regards the test as very valuable from the prophylactic standpoint. S. Meyer,¹⁷ on the other hand, as the result of a study of the literature and his own investigations, concludes that the Dick reaction is not the expression of susceptibility to scarlet fever, but only an indication of the condition of immunity or susceptibility to streptococcal infection, as reactions similar to the Dick reaction can be produced with the toxin of various other streptococci.

J. C. J. McEntee¹⁸ carried out observations on the Dick test under the reviewer's supervision in 520 cases, which were subdivided into the following sub-groups: (a) 265 cases of definite scarlet fever, (b) 23 cases of clinically doubtful scarlet fever, (c) 199 diphtheria patients who had not had scarlet fever, (d) 13 nurses, (e) 20 medical students. Unlike Zingher, who obtained 100 per cent positive reactions in the acute stage, only 78.6 per cent of the definite scarlet fever cases gave a positive reaction during the first four days of the disease. From the fifth to the seventh day only 40 per cent were positive, from the eighth to the seventeenth day 38.1 per cent, from the eighteenth to the thirty-first 26.1 per cent, and from the thirty-second day and later 15.7 per cent. The number of positive reactions during the course of the disease thus showed a steady fall corresponding to the production of antitoxin, as had been found by previous observers. On the other hand, the behaviour of the reaction was not sufficiently constant during the acute stage of the disease to be of diagnostic value.

PROPHYLAXIS.—W. T. Benson and G. W. Simpson,¹⁹ from observations on the nurses of the Edinburgh City Hospital, came to the following conclusions: (1) By injection at intervals of from five to fourteen days of gradually increasing doses of scarlet-fever toxin it is possible to render the majority of Dick-positive reactions Dick-negative. Thus, of 42 originally Dick-positive nurses, 37, or 88.1 per cent, were rendered Dick-negative by injections of the specific toxin within varying periods of time up to eight months from the completion of the primary course of protective injections. (2) If the dosage is carefully graded, immunization can be accomplished without any unpleasant reaction or permanent ill-effects; 35 of the 42 nurses were given four injections at five-day intervals of 200, 400, 800, and 1000 skin-test doses of toxin, and in 7 nurses a course of three injections at 14-day intervals of 200, 1000, and 2000 skin-test doses of toxin was tried. (3) While active immunity can be obtained by injection of relatively small quantities of toxin, its duration in originally Dick-positive cases is only a few months. (4) If a more lasting immunity is desired in Dick-positive reactors, much larger doses of toxin are required.

The importance of obtaining cultures free from hæmolytic streptococci before discharging scarlet fever patients from hospital is emphasized by J. E. Gordon²⁰ as well as by Friedemann and Deicher.^{6, 7} Gordon found that cultures were positive in 91.4 per cent of return cases as compared with a general rate of 47 per cent. Friedemann and Deicher report that in a group of 50 cases of scarlet fever in which three negative swabs of the tonsils were obtained no return case occurred, whereas among 39 patients who were discharged with positive streptococcus cultures there were 4 return cases.

TREATMENT.—In a discussion on the **Serum Treatment** of scarlet fever, both E. W. Goodall²¹ and J. D. Rolleston² protested against the use of serum in every case of scarlet fever as recommended by some enthusiasts. The concentrated form of serum which reduces serum sickness to a minimum is expensive, but, apart from this, Rolleston pointed out two objections: (1) That the serum disease might be more severe than the attack of scarlet fever; (2) That

the patient was rendered hypersensitive for some years to come, so that if serum were needed at a future date for prophylactic or therapeutic purposes the reaction was likely to be very violent. Rolleston had therefore used scarlet-fever antitoxic serum in only 62 cases, which he divided into three classes. The first class consisted of 23 cases in which there appeared to be immediate and marked benefit from the serum. In the second class there were 24 cases in which the benefit, though definite, was less pronounced; and in the third class there were 15 cases in which no benefit resulted. A serum rash was noted in 26 cases; in 9 there were pyrexia and constitutional disturbance attributable to the serum, and sometimes there were secondary adenitis and pains in the joints such as were met with in serum sickness due to other serums.

REFERENCES.—¹*Bull. de l'Office Internat. d'Hyg. Publ.* 1926, 1295; ²*Proc. Roy. Soc. Med.* 1927, xx, 1179; ³*M.A.B. Rep.* 1926-27, 109; ⁴*Jour. Preventive Med.* 1927, i, 279; ⁵*Rep. Pub. Health and Med. Subj.* No. 35, 1927; ⁶*Deut. med. Woch.* 1926, 2147; ⁷*Ibid.* 1927, 1163; ⁸*Amer. Jour. Hyg.* 1927, vii, 84; ⁹*Jour. Amer. Med. Assoc.* 1926, lxxxvii, 96; ¹⁰*Amer. Jour. Dis. Child.* 1927, xxxiii, 926; ¹¹*Lancet*, 1926, ii, 1207; ¹²*Arch. of Pediatrics*, 1927, xlv, 395; ¹³*Munch. med. Woch.* 1927, 495; ¹⁴*Rev. méd. de la Suisse Rom.* 1926, 824; ¹⁵*Lancet*, 1926, ii, 854; ¹⁶*Wien. med. Woch.* 1927, 47; ¹⁷*Zeits. f. Kinderheilk.* 1927, xlii, 258; ¹⁸*Brit. Jour. Child. Dis.* 1927, xxiv, 91; ¹⁹*Lancet*, 1927, i, 281; ²⁰*Jour. Preventive Med.* 1927, i, 255; ²¹*Proc. Roy. Soc. Med.* 1927, xx, 1171.

SCHISTOSOMIASIS. (See also BLADDER, DISEASES OF.)

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

N. H. Fairley¹ records further studies in the chemotherapy and immunity reactions of schistosomiasis through the use of goats infected with *S. spindalis*. He found that intravenous injections of alcohol-soluble cercarial extracts produced a marked increase in the antibody contents of the goat's serum, but had no effect on the course of the disease. N. H. Fairley and F. Jasudasin² point out that the Indian water buffalo is much exposed to infection with schistosomes owing to its habit of lying for hours in pools, but it has not been found naturally infected. Two young animals were therefore exposed to the action of 59,800 and 58,500 cercariae, and, when killed after 81 and 94 days respectively, living schistosomes were found in both in the portal and mesenteric veins, ova with living miracidia were demonstrated in the wall of the large and small intestines, and bilharzial pseudo-tubercles containing ova were found in the liver. Further, complement-fixation reactions developed during the course of the infections, but of less intensity than in infected goats owing to the great size of the buffaloes. In view of these animals inhabiting tanks known to harbour infected molluscs, they suggest that they will be found to constitute the chief definitive host of *S. spindalis*. In a further paper, N. H. Fairley³ shows that the infection of monkeys (*Macacus simicus*) with *S. spindalis* results in early spontaneous cure.

TREATMENT.—R. M. Gordon,⁴ in Sierra Leone, points out that under the conditions there it is not possible to get the Africans infected with bilharzial disease to continue intravenous injections of tartar emetic or emetine hydrochloride long enough to cure them, so he has tried Emetine Periodide orally with quite as good results as those with emetine hydrochloride subcutaneously in children, in whom emetine has some advantages over tartar emetic. Fourteen cases of similar average severity were used for trials of each drug. One grain of emetine periodide was given orally three times a day on fifteen consecutive days in the powder form in milk, as gelatin capsules were found to pass through the bowel unchanged in some cases. No vomiting or other unpleasant symptoms were noted, and the children came regularly for the treatment.

REFERENCES.—¹*Trans. Roy. Soc. Trop. Med. and Hyg.* 1926, Nov., 236; ²*Ind. Jour. Med. Research*, 1927, Jan, 701; ³*Ibid.* 685; ⁴*Amer. Trop. Med. and Parasitol.* 1926 Aug. 13, 229.

SCHOOL CHILDREN, MEDICAL TREATMENT FOR.

Joseph Priestley, B.A., M.D., D.P.H.

It is not generally realized what is really being systematically done in connection with the medical treatment of school children. Under the Education Act 1921, power was given to the Board of Education to issue Regulations for specific purposes. These Regulations were issued in 1925, and are known as the Statutory Rules and Orders 1925, No. 835. Under these Regulations each child in a public elementary school must be medically examined (a) on admission, (b) on attaining the age of 8 years, and (c) on attaining the age of 12 years. Arrangements, with the sanction and approval of the Board of Education, must be made by local authorities as follow : (1) For following up cases of defects discovered in the course of medical inspection ; (2) For the detection and prevention of uncleanliness ; (3) For the medical treatment of defects of eyes and teeth, minor ailments, and enlarged tonsils and adenoids. This is a considerable advance in practical State medical service. The Regulations are not restricted to children of school age, but refer also to (a) young persons under 18 years of age attending secondary schools, continuation schools, pupil teacher centres, preparatory classes, junior technical schools, etc. ; and (b) children under 5 years of age attending nursery schools.

SCHOOL EPIDEMICS AND THEIR MANAGEMENT.

A. I. Simey, M.A., M.D., F.R.C.P.

Whenever susceptible persons are congregated together in considerable numbers they are liable to be visited, from time to time, by infectious diseases in epidemic form. Where the numbers so congregated live and sleep in common quarters, the probability of the spread of infection is increased ; and where the susceptibility is high, the chance of an epidemic is still greater. For the purposes of this article schools may be regarded as communities of susceptible persons congregated together periodically in close quarters, so that in them conditions are present which are remarkably favourable to the occurrence of epidemics.

There are three factors which make schools particularly liable to epidemics. The first is the age of those who make up the school population. It is quite obvious that the younger the individuals, and therefore the more sheltered their previous existence, the less is the likelihood that they have already been exposed to infection. Secondly, the population of a school is constantly losing its older members and supplementing its numbers by a corresponding addition of younger pupils. In a public school about 20 per cent change places in this manner every year. In other words, there is a slow and constant influx of less immune subjects, to take the place of the more immune material which passes out of the school. Thirdly, the school year is divided into three terms separated by three periods of holiday. During these periods, the school population is disseminated and exposed to infections in meeting-places of various kinds, the chief of which are theatres, parties, and railway trains. The holiday periods are of such duration that the incubation periods of the diseases, often unwittingly contracted, may extend into the first week or two of the following term, so that a fresh strain of infection is introduced into the school.

The epidemics which befall schools may be divided, for convenience of description, into two main classes : (1) Those which commonly occur in the community at large ; (2) Those which more particularly affect schools. In the first class are included : (a) Those diseases which are not so universally infectious as others, such as scarlet fever, diphtheria, enteric fever, poliomyelitis and its allies ; (b) Those diseases which, though universally infectious, do not convey immunity of any great duration to the person who suffers from an attack : the

chief of these is 'influenza'. In the second class we may consider most of the so-called zymotic diseases, such as measles, whooping-cough, rubella, chicken-pox, mumps, and certain other contagions such as impetigo contagiosa and epidemic catarrhal conjunctivitis.

Before considering the management of school epidemics, it is necessary to point out the different circumstances which prevail in day-schools and boarding-schools respectively; for in the former the pupils feed and sleep at home, and infectious cases are dealt with in their private houses, so no hospital accommodation need be provided by the school authorities. In boarding-schools the problem is much more complex, as sufficient accommodation has to be provided for a large number of patients simultaneously, sometimes 30 to 40 per cent of the whole community, or even more if two or more infections are prevalent at the same time. This article will deal with boarding-schools, and more especially with public schools, in which the number of boys is usually much greater than in preparatory schools, and thus the problem presents itself in a much more serious form. No doubt the ideal way of managing school epidemics is to make them as few and as light as possible by preventive measures. To eliminate them altogether is an ideal at which we should aim, but cannot hope to attain at once, for we have not yet found the organisms concerned in measles, chicken-pox, rubella, and mumps. But recent researches in the case of scarlet fever and diphtheria, and the success which has followed prophylactic inoculation after investigation of the skin reactions known as the Dick and Schick tests, give good ground to hope that success will ultimately be obtained. Small-pox cannot now be regarded as a cause of school epidemics, for the vaccination of infants has largely protected the public; and such isolated outbreaks as occur affect rather the poorer quarters of towns where anti-vaccination is rife than the pupils of boarding-schools, in most of which vaccination is compulsory.

PROPHYLAXIS.

There remain certain rules which have been adopted in the past to prevent the entry of infectious diseases into schools, and to abort them when they make their appearance. The former are based upon notification of exposure to infection during the holidays, the latter on the immediate isolation of any pupil suffering from fever or malaise on returning to school, and on the isolation of supposed contacts of any pupil in whom an exanthem is discovered to exist.

By these rules, those who have been exposed to a specified infection during the holidays are not allowed to return to school until the full possible incubation period has elapsed, unless they have themselves previously suffered from a well-marked attack of the disease, in which case they are considered to be immune. Such measures are possibly effective up to a certain point, and may keep infection out of a school for a certain period. But experience shows that infection comes, as a rule, not from suspected but from unsuspected quarters, and that its direction of spread is not usually the most obvious; so that, taken on the whole, much valuable time is lost to those detained in quarantine without results sufficiently obvious to justify the imposed detention. Moreover, the longer a given infection (e.g., measles) is kept out of a school, the greater will the number of susceptible pupils become, so that when at last it does gain an entry the result is an epidemic of abnormal proportions which is apt to become more and more virulent the longer it lasts. In my own opinion enteric fever, diphtheria, scarlet fever, and poliomyelitis and its allies are the only exanthems which justify special rules of quarantine in boarding-schools, and the excessive vigilance adopted in some preparatory schools is partly responsible for the big outbreaks of infectious disease in the public schools.

The diseases to which reference has just been made do not usually give rise to large epidemics in schools : it is more usual to find sporadic cases occurring at irregular intervals ; but it must be borne in mind that they are liable to occur in epidemic form also. In the hands of experts, considerable reliance may be placed on the Schick and Dick reactions to discriminate between those who are and are not susceptible to diphtheria and scarlet fever ; and, further, those proved to be susceptible may be rendered temporarily immune by suitable inoculation ; but in the present state of our experience it needs an expert to interpret the skin reactions sufficiently correctly to use them with any confidence, and, failing expert help, it is better to rely on the older methods of quarantine and careful swabbing of contacts.

Before leaving the question of prophylaxis, special reference should be made to the question of water and milk supplies.

If, by any accident, either by contamination through faulty drainage or by flood water, there is any suspicion of temporary impurity of water, all the drinking water should be boiled for five minutes or passed through an unglazed porcelain filter, the candle of which must be sterilized by baking once a fortnight. Of these measures, boiling is far the safer. All school drains should be periodically tested by an expert sanitary official, with extra inspection after the occurrence of a winter of unusually heavy frosts.

The milk-supply should be beyond suspicion, obtained from a farm or farms belonging to or directly controlled by the school. Special precautions should be taken as to its delivery and storage when it reaches the school premises. Serious epidemics of enteric fever have been traced to infected water, whilst it has been shown that, in addition to tuberculosis, typhoid fever, scarlet fever, diphtheria, and septic conditions of the throat have resulted from contaminated milk.

MANAGEMENT OF AN EPIDEMIC.

The management of epidemics in schools differs according to the nature of the epidemic and the stage at which a particular epidemic has arrived. There are some, notably measles and influenza, which are more to be feared on account of their complications than others, such as rubella and chicken-pox.

It is advisable in the early stages of an epidemic to consult the records and estimate how many pupils have or have not had a previous attack, and are or are not therefore likely to succumb during the prevalent epidemic. For this purpose an accurate case-sheet of every boy's health should be kept by the medical authorities. By such records it is also often possible to estimate roughly how many cases to expect by a given date, especially in the early stages of an epidemic, when the separate rounds can still be recognized. Preparations must be made accordingly. It will be necessary to provide extra help and accommodation of various kinds. Special nurses must be provided, and an extra staff of indoor assistants.

A school hospital or sanatorium should always have at least 15 per cent of available beds ; but in times of epidemic, three or four times that number may be required, with full equipment of mattresses, blankets, and linen, of which there should be a lavish supply. Extra silver and crockery will be needed, and must be bought or hired. Special provision must be made for the sterilization and washing of soiled linen and blankets.

Inasmuch as the medical officer must be prepared to admit many patients in the prodromal period, before the characteristic rash or phenomena have declared themselves, it is of prime importance that he be provided with a reasonable number of single-bedded rooms, or of beds suitably partitioned off from the rest of the ward, to accommodate such cases until the diagnosis is established.

It is advisable to keep patients together who are about in the same stage of the disease, and not to mix convalescent with fresh cases. This is easy enough in the early stages of an epidemic, but becomes more and more difficult as round succeeds round, some patients running a normal course whilst others develop complications necessitating a prolonged stay in bed.

It is most essential to clear a whole ward out, from time to time, and give it a thorough cleaning and airing for twenty-four hours or more; but this is most difficult to arrange when the increasing epidemic creates a shortage of beds. Difficulties become still greater when two or more infectious diseases are prevalent simultaneously, and it may become necessary to seek accommodation in other premises, or to improvise a hospital ward in a dormitory belonging to one of the school boarding-houses.

It is advisable to arrange that separate infections be nursed in separate units or on separate floors of the school sanatorium, and that the nurses assigned to such units shall not take duty or visit patients out of their own unit; an exception must be made in the case of night nurses, who may be called to any patient during their hours of duty. All nurses should wear overalls whilst on duty nursing cases of infection; they may then safely meet for meals or recreation in a common room, except in the case of those attending diphtheria, who should be kept strictly apart from the rest. It is essential that good sleeping quarters and dining-rooms be supplied for the nurses, and special care should be taken to ensure that the night nurses are undisturbed during their sleeping hours.

Rôle of the Matron.—The matron of a school sanatorium in times of epidemic has heavy duties thrown upon her shoulders. Whilst primarily responsible for the proper nursing of the patients, she should engage such extra nurses as are required, and see that they are well fed and housed; she must engage extra help for the domestic staff, and superintend the diet of the whole household, including patients and staff. She should attend the medical officer on his rounds, so that she may know about the progress and requirements of each of her patients, and order the diet prescribed for them. She must see that there is a sufficient supply of clean linen, blankets, crockery, and nursing requisites, and she must be on the alert to deal with matters of discipline and questions such as the admission of parents and other visitors. It is of the utmost importance that the visits of the medical officer be at certain regular hours so that she may be able to arrange her daily work with precision and economy of time.

Visitors.—During a serious school epidemic it is desirable that visiting should be cut down to a minimum, and under no conditions should the patients be visited by their schoolboy friends. Visitors are of two kinds: (1) Parents and relations who have really ground for anxiety; (2) The head master, chaplains, and house masters, who are *in loco parentis* in the absence of parents. All visitors should be careful to come at convenient hours only, and before entering a ward should obtain the sanction of the matron or her representative. Their visits should be very brief, and they should never sit in the ward or bring in any form of food, fruit, or sweetmeat for any individual patient. If required so to do they should wear overalls, and they should enter only such rooms as are considered advisable by the medical authorities. No visitor should be admitted to see a patient who has not himself suffered from the prevalent form of disease; nor should anyone enter the sanatorium under any pretext who is not in perfectly sound health at the time.

Daily Report.—An official report on the condition of each patient should be sent daily by the medical officer to the head master and house masters, who should be responsible for keeping the parents informed about the condition of their children. This report may be supplemented by the masters at their

discretion, with such comments as they are able to supply after visiting their patients. The medical officer should neither be expected nor encouraged to correspond with the parents of his patients, except under exceptional circumstances. It is impossible for him to report both to the school authorities and to the parents, and it is essential that house masters should receive a daily official report as to the progress of their pupils in the sanatorium.

Nursing.—In some big schools, all patients except those suffering from scarlet fever, diphtheria, or some other serious infection, are nursed in their own boarding-houses. I do not think this is the best arrangement, for it throws extra work on the staff of the boarding-house and on the medical officer, whose work should, as far as possible, be concentrated in one building, which is a sanatorium specially designed for the purpose, with suitable lavatory, bathing, and heating accommodation, and with proper conveniences for the nursing staff to carry out their work as efficiently as in the wards of a general hospital. Where the different boarding-houses are attended by different medical officers, the arrangement by which patients are nursed in their boarding-houses is less difficult, for it would be extremely difficult for several medical officers so to arrange their times at the sanatorium that they do not clash, and the matron's work would be very much more difficult if she had to be called away from her other duties at any time in the day to go round the wards with the various doctors.

Even where there is a central sanatorium it will be necessary at times of stress to stress a considerable proportion of sick boys in temporary accommodation in a boarding-house, such as a converted dormitory. In such cases a properly trained nurse or nurses should usually be engaged to take charge of the patients, who should not be left to the care of the ordinary staff of the house. A better plan, when possible, is to draft convalescents back from the sanatorium to a converted dormitory in the boarding-houses; but this is not always easy to work smoothly, and when relapses or complications occur in convalescents, difficulties arise of a very undesirable nature.

It is a great convenience for every boarding-house to have several single-bedded sick-rooms for the observation of doubtful cases before their removal to the sanatorium, especially when the sanatorium accommodation is insufficient; but ideally there should be an adequate number of such observation rooms in the main sanatorium, so that there may be as little moving of sick boys as possible from one establishment to another.

It is imperative, especially in winter, that all passages and water-closets in the sanatorium be thoroughly warmed to minimize the risk of bronchial and other affections in patients who are fit to use the lavatory instead of being attended to in bed, or using a commode by the bedside. All patients, and especially boys, have an instinctive dislike to the use of bed-pans, and many maintain that the result is not so satisfactory as it is if they are allowed to get out of bed. The question is one which needs careful consideration for each individual case, but the risks of any harm resulting from a visit to the lavatory are greatly decreased if these premises are properly warmed. In building a new sanatorium this is a point which should receive the careful attention of the architect.

If, in the course of an epidemic, a patient shows signs that he is not progressing favourably or develops a complication, or is obviously prevented from sleeping or properly resting by other patients in the same ward, he should be quietly and unostentatiously removed into a small room which must be reserved for such cases, and, if need be, he must be watched and attended to by a special nurse or nurses.

Care of Clothing, etc.—When a boy enters the sanatorium with an infectious

disease his clothes should be removed and placed, together with his other belongings, in a suitable store-room. It is better that they should not be kept in drawers in the ward, although this expedient may be necessary for want of other accommodation. His linen and the washing of the sanatorium should be sent to a special laundry either belonging to the school or set aside for the school sanatorium by special agreement. The number of sheets and blankets used during an epidemic is very great, and it is important that the washing be done quickly and thoroughly, with special attention to thorough airing of bed-clothes. Of personal washing there is not so much, but it is important that this be done well, especially in the case of the uniform and linen worn by nurses and attendants.

Whilst in the sanatorium, patients should use paper or cheap cotton handkerchiefs, or pieces of old linen, which can be burnt instead of being sent to the laundry. The catarrh which accompanies many infectious diseases causes a discharge of thick mucus from the nostrils which is probably most rich in infective material, and far the best destination for such things is the furnace. Tooth-brushes also should be burnt before a patient returns to school. I believe much infection is harboured in the bristles of brushes both for the hair and the teeth. Speaking generally, washing in a proper laundry is sufficient disinfection of a patient's clothes after an infectious disease. Cloth clothes should be aired in the sun and wind. In certain cases, including diphtheria and scarlet fever, clothes and linen should be disinfected in a steam sterilizer; every school should possess one of these. It is not necessary to destroy books and other belongings used during convalescence except in the case of scarlet fever and diphtheria, and even in these cases really valuable objects may be kept after a thorough dusting and exposure to wind and sunlight. But it is better to provide only cheap editions of books and magazines, and to destroy them, or send them on to a fever hospital if acceptable.

Convalescence.—One of the surest signs of recovery in a boy is the desire to make a noise and exercise his voice as well as his limbs; this may seriously interfere with the welfare of another patient in the same ward who has not yet arrived at the noisy stage. Hence every possible means must be taken to keep convalescents amused and occupied in bed until they are fit to get up and go to the recreation room or into the open air. As soon as this stage approaches, the patient should be allowed first a daily hot bath, with special attention to the scalp. School-boys are not nearly careful enough about general tidiness, and especially about the condition of their hair and scalp. If greater tidiness and shorter hair were made compulsory, there would be fewer epidemics of skin diseases such as impetigo contagiosa and of the infective eye disease familiarly known as 'pink eye'. There is no question that a daily bath and a good rub down with a bath-towel promotes recovery and shortens the period of infectivity. This period is still further shortened by exercise in the open air.

In summer, croquet, bowls, and clock golf may be permitted in the sanatorium garden; in winter, short country walks may be permitted, provided that the disease from which the patient is recovering is not diphtheria or scarlet fever. Before going for a walk, each patient should receive instructions from the matron as to how far he may go and in what direction, so that, in case of his belated return, steps may be taken to find him. It is not desirable that patients should go out alone, but either with a companion or with a nurse, and they should be given strict instructions to walk as far as possible in the middle of the road, lest they come into contact with susceptible persons on a footpath. They should not talk with passers-by, and never enter a shop or any house whatsoever whilst they are out for exercise. On return they should report to the matron, and immediately change their shoes and go to the recreation room.

A important question to be decided as convalescence proceeds is when a patient is fit to return to school. This question can be approached from two points of view: (1) The patient's health; (2) The risk of his conveying infection. As to the latter of these questions, reference should be made to a recent text book or to some code of rules, such as that published by the Medical Officers of Schools' Association, a new edition of which is shortly to appear. As regards the patient's health, one must remember that it is a very great change for a boy to leave the shelter of the school sanatorium for the rigours of school life and duties, although he may have no outward sign of physical impairment or even weakness. In any case a pupil should neither take part in nor watch the school games for at least a week or ten days after he returns to school, and arrangements should be made for extra sleep or an alteration to diet in special cases.

It is common for a boy to lose weight rapidly during an attack of measles or diphtheria, and until he has regained his normal weight he is not safe to join in school games and exercises. Thus, as much as a stone may be lost in a month and recovered almost as quickly afterwards. It is not, however, exactly possible to know exactly what a patient's weight is on admission, and it is also difficult to say when he has regained his former weight. If, however, after an infectious disease, a patient continues to put on weight with rapidity, the probability is that he is making up what was lost, and should be kept back from games and exercises likely to throw undue strain on his heart and nervous system. In many of the more severe cases a change of diet is desirable.

Disinfection. A question naturally arises at the end of an epidemic as to what the premises occupied by a boy during his illness should be disinfected. In attempting to answer this it must be pointed out that the most infectious period in a given case of an exanthem is in the early stages, i.e., the two or three days preceding and immediately following the appearance of the characteristic phenomena of the disease. Hence any disinfection of premises, to be of any value, must include all places visited by a patient whilst sickening for the disease in question. This would mean disinfecting the dormitory, the study, the dining room, the chapel, and other buildings he leaves behind, which is obviously impracticable. Even if it were practicable it would not be efficacious, for it is almost impossible by chemical or physical means to sterilize a room. Hence we are driven to the conclusion that it is futile to go beyond the ordinary methods of extreme cleanliness. The best means we possess of rendering the premises safe is to open the windows and let in air and sunlight and to wash floors and furniture scrubbed with soap and water. It is probable that the cause of the exanthems, robbed of their hosts, die a natural death quickly.

The danger lies far more in the throat and nose of the patient, lest he become a source of infection, as is not infrequently the case in scarlet fever and diphtheria. The premises occupied by patients suffering from these two diseases may be made additionally safe by thorough redecoration and attention to cisterns, lavatories, and basins, and drinking vessels used by or for them in their illness. It is noteworthy that, in the opinion of some authorities, it is safe to nurse scarlet fever on a ward containing other classes of diseases, provided that the beds are separated by a sufficient interval, and that the nurses use overalls and antiseptic lotions as for cases of enteric fever.

The Question of Closing a School.—There may arise, from time to time, a question as to whether a school should break up temporarily when attacked by epidemic disease. Such an expedient should never be adopted except under most exceptional circumstances, and only then after due consultation with local health authorities. It must be taken into consideration that such a

measure may possibly relieve the school of a temporary difficulty, but it may also spread the disease among the public in various directions, and cause great inconvenience and expense to the parents of the pupils.

If the epidemic is a serious one and complications arise in an undue number of cases, it is open to the head master to notify parents and give them an opportunity of removing their sons; it may be desirable even to advise that certain boys, to whom the risk of contracting the prevalent disease is extra serious, should be sent home. But it is a far more serious step to suggest that a whole school be disbanded because of a prevalent epidemic, and the conditions under which this course should be adopted must very rarely arise.

PROPHYLACTIC INOCULATION AGAINST INFLUENZA.

In the early part of this article reference was made to prophylactic inoculation against scarlet fever and diphtheria. It may be wise, in conclusion, to devote a few lines to the question of *prophylactic inoculation against influenza*. This disease, be it what it may, a genuine thoroughbred or, more likely, a mongrel of many mixed strains, is the cause of far more trouble in schools, far more epidemics, than all the exanthems put together.

Could we eliminate 'influenza' we should improve the health of schools by 50 per cent. Such evidence as has been collected to show the effect of prophylactic inoculation in schools is inconclusive. Some brilliant results have been recorded, other complete failures, and some expressions of half-hearted doubt. The reason, I think, is not far to search. Each epidemic of influenza differs a little from the last because of some new strain, possibly of streptococcus, introduced; consequently no standard vaccine is universally efficacious. It is not improbable that, when prophylactic vaccination fails, it is because the peculiar strains present in a given epidemic are not included in the vaccine, and possibly also the dosage is at fault. The question needs further investigation by experts, but the efficacy of prophylactic inoculation against influenza must not be condemned because it is not proven.

APPENDIX :

A SUMMARY OF MODERN METHODS IN THE DIAGNOSIS, TREATMENT, AND PROPHYLAXIS OF DIPHTHERIA AND SCARLET FEVER.

I. Diagnosis.—(See *Plates XI–XIII*, p 114, and *Plate XXIX*, p. 413.)

1. To distinguish those who are susceptible from those who are immune to diphtheria and scarlet fever.

Apply the Schick and Dick tests (intradermal) with controls.

2. To diagnose true scarlet fever from diseases accompanied by a scarlatiniform rash.

a. Apply Dick test. All true cases of scarlet fever will be positive in the early stages, negative later on.

b. Apply Schütlz-Charlton intradermal (bleaching) test.

II.—Passive Immunity.—

1. To confer temporary immunity of short duration on patients proved by the Schick reaction to be susceptible to diphtheria.

Inject 1000 to 2000 units of diphtheria antitoxic serum.

2. To confer temporary immunity of short duration on patients proved by the Dick reaction to be susceptible to scarlet fever.

Inject 2.5 to 5 c.c. of concentrated scarlet-fever antitoxin.

III. Active Immunity.—(Of considerably longer duration.)*a.* Against diphtheria.

Give 3 consecutive doses of 1 c.c. each of diphtheria toxin antitoxin (T.A.T.) at intervals of one week.

b. Against scarlet fever.

Give 5 multiple skin test doses intramuscularly at intervals of a week, beginning with 250 skin test doses and increasing the dose each time; for amount, consult an expert in this branch of treatment.

IV. Therapeutics.—

1. *To treat Diphtheria.*—Inject diphtheria antitoxic serum either subcutaneously, intramuscularly, or intravenously, according to the urgency of the case. Large doses of at least 5000 units should be given early, followed by larger doses as soon as 6, but usually about 24, hours later.

N.B.—Children should receive the same doses as adults.

2. *To treat Scarlet Fever.*—Inject concentrated scarlet fever antitoxin intramuscularly or intravenously, 10 to 40 c.c.

SCLEREMA NEONATORUM. *A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.*

G. A. Harrison and J. W. McNee¹ and A. M. H. Gray² have described two cases of sclerema neonatorum in which cystic swellings, containing masses of acicular crystals, occurred. Histological examination of the hard fatty masses from these cases, as well as from cases of sclerema showing no cystic swellings, showed that a deposit of crystals had occurred throughout the indurated areas, and that the affected lobules were surrounded and gradually replaced by a cellular exudate. These crystals, which had been previously described and considered to be fatty acid crystals, have been studied by Harrison, who concludes that they are crystals of neutral fat, either palmitin or stearin, or both, or the glycerides of higher fatty acids. Harrison has further shown that a very slight percentage reduction in the olein content of fat markedly raises the melting-point. It is suggested that in cases of sclerema neonatorum the first process is a disturbance in the olein contents of the fat-cell, followed by a deposit of crystals of palmitin and possibly stearin, and that these substances act as foreign bodies setting up a local inflammatory reaction of the granulomatous type. Gray considers that there are two distinct types of sclerema, the first commencing within the first few days of life, giving rise to symmetrical but localized indurations of the subcutaneous fat and associated histologically with the changes described above. This condition is not necessarily associated with a fall in body temperature—the temperature may even be raised—and does not necessarily occur in weakly infants, nor is the prognosis always unfavourable. To this type he thinks the name of sclerema neonatorum should be applied. The other type is a sudden hardening of the subcutaneous fat which occurs in infants suffering from a severe wasting disease, generally epidemic enteritis, and may occur in infants several months old. In the one case examined the histological changes described above were not found. To this class of case Gray suggests that the name acute sclerema should be applied. He strongly deprecates using the term scleroderma neonatorum, pseudo-sclerema, or scleroderma in either of these types of case.

REFERENCES.—¹*Arch. Dis. in Childhood*, 1926, i, 63 and 123; ²*Arch. of Dermatol. and Syph.* 1926, Dec., 637.

SERUM DISEASE.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—F. Gierlmühlen¹ quotes the statistics of previous German writers, according to whom the frequency of rashes following injection of diphtheria antitoxin ranged from 5 to 23 per cent, and records his

own observations on 2772 cases of diphtheria in which serum rashes occurred in 10·2 per cent. The frequency of the rashes appeared to depend upon the amount of serum injected, although this relationship was not constant. Serum rashes were more frequent after intravenous than after intramuscular injections. Giertmühlen's series did not show any difference in the incidence of serum eruptions in the two sexes among adults; but in children, boys were more frequently affected than girls. A neuropathic constitution, an irritable skin, and the exudative diathesis appeared to be predisposing factors. Serum rashes were least common in April, and most frequent in May, August, July, and January. In laryngeal diphtheria they were rarer than in the faucial form, in spite of larger doses and the intravenous method employed. They usually appeared from the fifth to the seventh day after injection, and lasted only one day. More severe complications were not observed, and 59 per cent of the cases were afebrile. In 87 per cent the rashes were urticarial in character. [It does not yet appear to be generally recognized that the frequency and intensity of rashes and other serum phenomena, as pointed out by the reviewer in 1905, bear not only a direct relation to the size of the dose of serum injected but also an inverse relation to the character of the initial attack of diphtheria. In other words, the more severe the attack of diphtheria, the less likely the occurrence of serum sickness in spite of large doses of antitoxin.—J. D. R.]

E. J. Feilchenfeld and H. Lehfeldd² found the following *changes in the leucocyte picture* in four cases of streptococcal septicæmia in adults treated by anti-streptococcal serum: (1) Complete absence of eosinophils at the height of the disease, and rapid increase in their number as soon as the good effect of the serum on the general condition became manifest; (2) A rise in the lymphocyte count; (3) A diminution in the displacement to the left. These blood changes were not merely a coincidence, as Lehfeldd had found similar changes in animals after serum treatment for streptococcal infection.

The subject of *neuritis and amyotrophy* following prophylactic or therapeutic administration of serum, to which reference has been made in previous issues (see MEDICAL ANNUAL, 1924, p. 408; 1925, p. 398; 1926, p. 421; 1927, p. 450), continues to receive attention, especially from French writers, such as V. De Lavergne,³ A. Léri and A. Escalier,⁴ J. Lerond,⁵ S. Carniol,⁶ and L. Giaccardo.⁷ De Lavergne has collected 46 cases from French literature, 27 of which followed antitetanic serum, 7 antipneumococcal serum, 4 diphtheria antitoxin, 2 antistreptococcal serum, 1 Maragliano's antituberculous serum, and 5 anti-plague serum. The paralyses are more frequent after small doses, as 23 of the antitetanic cases occurred after a dose of only 10 c.c. The patients' ages ranged from 6 months to 58 years, but most cases were met with between 20 and 40. The paralysis may be divided into two main groups: in the first the picture corresponds to paralysis of the brachial plexus, while the second consists of various forms of polyneuritis.

PROPHYLAXIS.—H. Heckscher⁸ treated 193 patients who had received large doses of diphtheria antitoxin by intramuscular injection of polyvalent staphylococcus vaccine on the fourth to ninth day after injection, and found that the percentage of serum sickness fell to 39·9 per cent, as compared with 53·6 to 59·6 per cent in controls. A suspension of polyvalent staphylococcus culture in normal saline was used, containing a thousand million killed organisms per c.c. Increasing quantities of the suspension were injected intramuscularly on five successive days. The doses for patients under 15 years were 0·2, 0·5, 1, 2, and 3 c.c., and for patients above that age 0·5, 1, 2, 3, and 5 c.c.

REFERENCES.—¹*Zeits. f. Kinderheilk.* 1926, xlii, 194; ²*Deut. med. Woch.* 1926, 2121; ³*Progrès méd.* 1926, 1597; ⁴*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1926, 428; ⁵*Ibid.* 1695; ⁶*Thèse de Paris*, 1926, No. 489; ⁷*Thèse de Lyon*, 1925-6, No. 113; ⁸*Acta Med. Scand.* 1926, lxiv, 504.

SHOULDER, RECURRENT DISLOCATION OF.

E. W. Hey Groves, M.S., F.R.C.S.

Melvin Henderson¹ makes a very useful report of a series of 30 cases of recurrent shoulder-joint dislocation treated by different types of operation. He reviews the various methods in common use, but considers that none of them are satisfactory in producing a sufficient proportion of permanent cures. Thus, in 19 cases in which capsulography was done, only 8 were cured. In 8, Clairmont's operation only gave 5 successes. The author therefore has elaborated another operation (Fig. 81) which he considers superior to either of these.

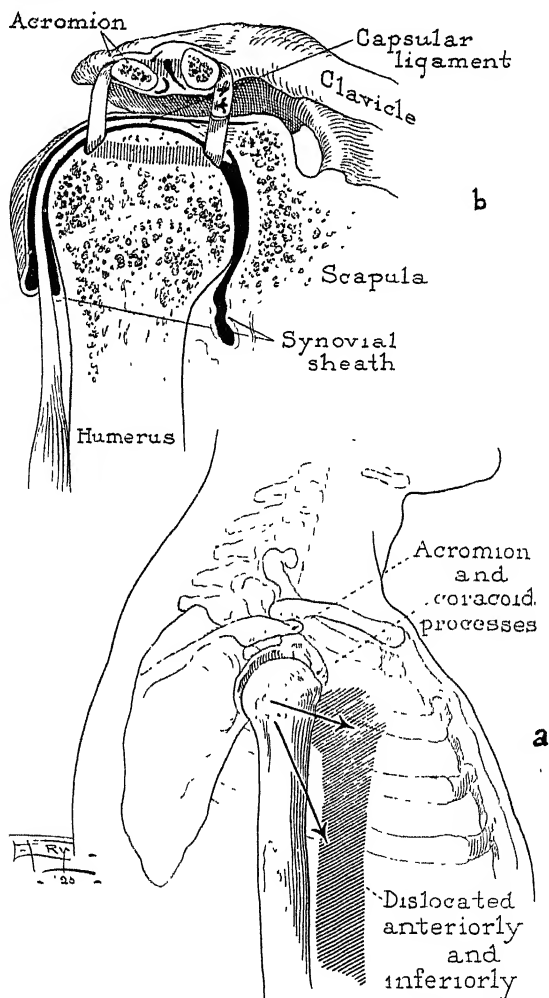


FIG. 81—Melvin Henderson's method in recurrent dislocation of the shoulder. *a*, Shadow outline showing the direction in which the dislocated head moves. *b*, 'Teno-suspension' of head of humerus to clavicle and acromion process, using the peroneus longus tendon. (By kind permission of 'Surgery, Gynecology and Obstetrics'.)

It consists in slinging up the head of the humerus to the acromion by means of a piece of tendon taken from that of the peroneus longus. No doubt such a slinging operation will be effective in preventing recurrent dislocation, but it is also open to two objections of a certain weight. In the first place, the peroneus tendon is a structure of some importance, and it would seem unnecessary to use it when the fascia lata can be used without any functional disability to the patient. Secondly, if a tendon sling be passed over or through the acromion and also through the head of the humerus sufficiently tightly to hold up the arm, it must act as a ligament which will check movements of abduction and rotation. The present writer is in agreement with Henderson's dissatisfaction with capsule-reefing operations and with that devised by Clairmont. The lesion of the capsule is below, in the depths of the axilla, and it is most difficult to get good access to this region and to effect a sound repair. Clairmont's operation consists in taking a slip from the posterior border of the deltoid and then bringing this forward through the quadrilateral space and attaching the free end to the acromion process. But a fleshy muscle cannot be given the strength and consistence of a ligament; neither can it be secured firmly to the coracoid in front. The method of using a band of fascia lata as a sling passed right round the joint and attached to the acromion by both ends behind and in front would seem to be a more rational method than any other, and free from the objection of making a check ligament on shoulder movements. This method is described and figured in the *MEDICAL ANNUAL* of 1925, p. 232.

Heymanowitsch² has also worked on the subject of habitual dislocation of the shoulder on somewhat the same lines as Henderson; but he has used the long tendon of the biceps muscle as a sling. The tendon is cut from its attachment to the glenoid cavity, passed through a tunnel in the bone, and attached to the acromion process.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1926, July, 18; ²*Zentralb. f. Chir.* 1927, March 12, 648.

SILICOSIS.

W. H. Wynn, M.D., F.R.C.P.

A. Mavrogordato¹ has made an important contribution to the study of miners' phthisis. Silicosis is a disease associated with certain dusty occupations. There are two factors of great importance in its etiology, viz., a phthisis-producing dust (silica) and an infective agent, of which much the most common is the tubercle bacillus. The terms 'tuberculo-silicosis' and 'silico-tuberculosis' have been suggested in order to indicate whether the dust factor or the tuberculous factor was primary and dominant in each condition respectively. Any measures directed towards the control of the disease must be based upon a proper appreciation of the significance of each factor. The tissue elements concerned in silicosis and tuberculosis belong to the same cell system, and the particular cell involved is the macrophage or 'lymphatic cell' of Calmette. With the continued invasion of the organism by a phthisis-producing dust, or by dead tubercle bacilli, the evolution of the tissue-cell system is determined towards fibrous tissue, the fixed and final form. With tubercle bacilli living and multiplying in the tissues, the picture is then dominated by other factors, such as interstitial pneumonia, caseation, and excavation. A phthisis-producing dust is a relatively inert and insoluble dust of the size of the common micro-organisms, and produces recognizable reactions in comparatively small doses. The one dust definitely known to be phthisis-producing is dust of free silica, and it is suggested that this property is related to the fact that its inertness and insolubility are only relative. Cells loaded with dust of free silica aggregate together and form 'pseudo-tubercles'. While many dusts, when inhaled, produce reactions in the lungs, it is doubtful whether the inhalation of a dust

is associated with pulmonary tuberculosis unless the dust possesses this property of provoking tubercle-formation and thus securing the arrest and accumulation of these dust-laden cells. Once an organ is effectively occupied by a phthisis-producing dust, its resistance to invasion by tubercle bacilli is lowered. The disabling and fatal form of miners' phthisis, as now met with on the Witwatersrand, is due to an infection by the tubercle bacillus superimposed upon lungs effectively occupied by a phthisis-producing dust. This event may or may not be preceded by a definite clinical silicosis. Delayed resolution and chronic progressive changes may occur in lungs effectively occupied by a phthisis-producing dust after recovery from acute pneumococcal or streptococcal infections. Coal-dust does not appear to influence the resistance of the lungs of guinea-pigs or rats to pulmonary tuberculosis.

Clinical silicosis may be progressive or non-progressive. This depends upon the absence or presence of an infective factor. Clinical silicosis may be infective from the beginning, and, in the early stages, it may be impossible to distinguish between simple and infective silicosis. Progressive silicosis may be tuberculous from the beginning, or the infective factor may be due to other micro-organisms. From the point of view of the clinician and pathologist there are three types of miners' phthisis: (1) Silicosis: damage due to dust alone, and non-progressive after cessation of exposure to dust in the absence of infection. (2) Tuberculo-silicosis: most of the damage due to dust; very bulky fibrotic lungs with the tuberculous element not necessarily either obvious or typical (*Plates XXX, XXXI*). The classical type of miners' phthisis. Progressive. Clinically silicosis precedes tuberculosis. (3) Silico-tuberculosis. Most of the damage typically tuberculous, occurring in lungs of ordinary size, the fibrotic element much less marked than in the classical type. This is the type now occurring on the Witwatersrand. Progressive. Clinically tuberculosis may precede silicosis.

A phthisis-producing industry is a phthisis-producing industry not only because the inhalation of dust facilitates the lighting-up of closed tuberculous foci, but also because the conditions facilitate the occurrence of inhalation infections and super-infections with the tubercle bacillus. An individual with open tuberculosis in a phthisis-producing industry is a special danger, particularly if the compound system obtains and the employees live, feed, and work together. Such individuals should be regarded as cases in a family rather than as random cases in a town. It is probable that the presence of water-droplets in the air facilitates the entrance of dust particles into the lungs, so that whilst the use of water greatly reduces the amount of air-borne dust, the residue is more dangerous than it would be in dry air. Experiments on the concentration of dust show that no improvement worth having can be secured until dust concentration is reduced to 20 mgrm. per cubic metre. A great improvement is secured when dust is reduced to 5 mgrm. per cubic metre. At this level a less grave form of disease is produced, and although the incidence is still formidable, it is about one-half of that associated with a concentration of 20 mgrm. per cubic metre. It may be possible to lower the concentration to a level at which the dust will not prejudice the health of miners during a reasonable period of working life, by working dry in big currents of clean air with an efficient means of catching dust at the source of production. Apart from dust control, inquiries in the following directions should aid in the diminution of the disease: (1) The systematic use of tuberculin to learn whether such a use will aid in the detection of susceptible subjects applying for employment; (2) The use of tuberculin to learn whether it may afford a means of assaying the resistance to tuberculosis of men not suffering from tuberculosis but employed in a phthisis-producing industry; (3) The use of vaccines to learn

PLATE XXX

MINERS' PHTHISIS

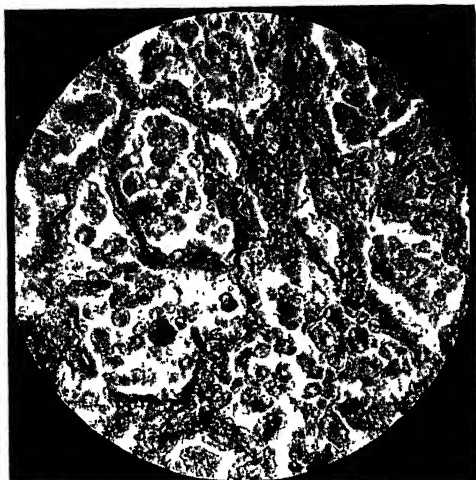


Fig. A.—Post-alveolar fibrosis. Death from pneumonia, no clinical silicosis.

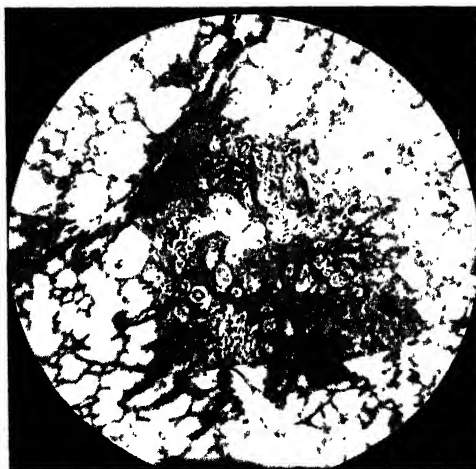


Fig. B —Isolated fibrotic nodule in lung substance.

*Plates XXX and XXXI by kind permission of the
South African Institute for Medical Research*

PLATE XXXI

MINERS' PHTHISIS—*continued*



Fig. C.—Skiagram of chest, showing miliary silicosis with calcification in some of the nodules.

whether the resistance of a healthy subject can be raised to an extent that will compensate for the degree by which resistance is reduced, owing to the inhalation of dust; (4) Rigid control of open tuberculosis in the closed population employed in the industry.

REFERENCE.—*Pub S. African Inst. for Med. Research*, No. XLX, Vol. III, 1926, 1.

SKIN, FUNGUS INFECTIONS OF.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Ringworm.—A very important advance has been made in the diagnosis of ringworm, and especially of ringworm of the scalp, in the last two years. It has been found that hairs and scales infected by ringworm fungus fluoresce much more brightly than normal hairs and scales of various dermatoses such as psoriasis or pityriasis capitis, when exposed to ultra-violet rays of wavelengths between 3600 and 3800 Ångström units. To obtain these particular rays the light of a mercury-vapour lamp is filtered through a sheet of what is known as Wood's glass. These rays, being outside the visible spectrum, cannot be seen by the naked eye, but when applied to an infected scalp or patch of ringworm on the body in a dark room immediately produce a strong fluorescence. Attention was first drawn to this by Mararot and Devèze¹, working in Pech's laboratory, and has subsequently been elaborated by P. Vigne,² who has described different appearances of diagnostic significance for various types of ringworm fungus and favus. A. C. Roxburgh³ has also called attention to certain aspects of the question. Not only is this method useful in diagnosis, but it is of even greater value in determining whether a case is cured as a result of treatment. This is a problem which is not only difficult, even to the most experienced, but very time-consuming, and a method which will demonstrate a single infected hair with precision and speed will prove of tremendous value in busy clinics. A point to be noted is that yellow vaseline also fluoresces brilliantly, although it is said to be easy to distinguish it from the fluorescence of the ringworm hairs, but it is always advisable to remove all traces of ointment by means of ether before applying the test.

Though for many years past X Rays have been the method of choice in ringworm of the scalp, it has always been held that children under three years of age should not be treated by this means. This was mainly due to the difficulty, or frequently the impossibility, of keeping very young children still during the somewhat tedious treatment, but also to some extent to the fear that the X rays might do some harm to the brain in children, whose skulls were very thin. J. M. H. MacLeod⁴ has, however, succeeded first in proving that the screening capacity of the scalp, skull, and membranes of the brain of a new-born infant is sufficient to render harmless any dose that can reach the brain, and has also devised a special couch and fixation apparatus sufficient to immobilize the child during exposure. He has treated 276 cases of children under the age of three by this method. MacLeod also refers to the occurrence of vomiting after X-ray treatment for ringworm: in his experience at the Goldie Leigh Homes of the Metropolitan Asylums Board it occurred in some 14 per cent of cases treated by gas tubes and in 39 per cent of cases treated by the Coolidge tube. The vomiting usually occurred some three hours after the exposure, was comparatively slight, and, as it was not preceded by definite nausea and only occasionally by headache, suggested cerebral vomiting. The sickness was transient and the child appeared none the worse.

In the last number of the MEDICAL ANNUAL (p. 452) reference was made to the work of Buschke and others, who showed that, by giving Thallium Acetate in small doses, epilation of the scalp could be produced without affecting other hairs of the body. Since that date this drug has been used by a large number

of observers with satisfactory results. The action of the drug has been described by W. E. Dixon.⁵ He states that the drug acts chiefly on the autonomic nervous system, apparently by diminishing the resistance of the cells to various impulses. He also shows that in small doses thallium actually stimulates the growth of hair. He points out that thallium rubbed into the skin does not produce epilation, nor does it produce any local effect on the blood-vessels; it is only after absorption that the metal affects the hair. The dose recommended by Buschke was 8 mgrm. per kilo. body weight, and this dose has been more or less universally used by others who have reported cases, though in one or two instances the dose has been 8.5 to 9 mgrm. The drug is given in a single dose in a small quantity of sweetened water. About the seventh day the hair begins to loosen, and by the nineteenth day epilation is usually complete. It has been noted by G. B. Dowling⁶ and others that the infected stumps do not always fall out so readily as the non-infected hairs, and that therefore some adjuvant method is usually necessary to remove the former satisfactorily, such as the application of adhesive strapping followed by sudden withdrawal. Dowling also considers that it is necessary to use some antiparasitic treatment all over the scalp to guard against reinfection of the new hairs. Buschke advocates the use of a 10 per cent Sulphur Ointment from the first day of treatment till the time of defluvium, when this ointment and Tincture of Iodine are applied on alternate days. Dowling states that he has had a better result since he has used this method of Buschke's than when he used a simple ammoniated mercury ointment, or Whitfield's benzoic and salicylic acid ointment. The hair grows much more rapidly than after X rays: this is no doubt due to the physiological action of the drug referred to above.

Administration of the drug is by no means without *toxic effect*. The commonest symptoms are joint pains, particularly in the lower limbs: these pains usually begin about the eighth or tenth day, occasionally earlier. They pass off by degrees, usually disappearing altogether in three or four weeks. Sometimes there is loss of appetite, drowsiness, and irritability. Although Dixon claims that thallium has no action on the kidneys, A. Ceston and C. R. Wilson⁷ state that transitory albuminuria occurs in certain cases, and advise careful testing of the urine before administration of the drug. They notice that the toxic symptoms are most pronounced in the older children, and it is probably owing to the absolute increase of doses necessary to cause epilation in them that these toxic symptoms are observed. It would seem therefore that for older children X rays still remain the most appropriate treatment. On the other hand, in younger children, especially in those under three years of age, who are not easy to X-ray except with the use of the restraining apparatus described by MacLeod, the thallium acetate treatment is likely to be of considerable value. Two things are essential: (a) the drug should be of the purest possible variety, and (b) the child should be accurately weighed naked.

Epidermophytosis.—This form of fungus infection, in which are included conditions known as dhobie itch, tinea inguinale, tinea interdigitalis, and various forms of eczematoid ringworm, was the subject of a very interesting discussion at the American Dermatological Association last year.⁸ The opener, C. J. White, dealt with the subject from the clinical standpoint, and analysed 1013 cases that had come under his own observation. This is certainly the most complete record that has so far been published, and coming from so accurate an observer deserves the most careful study. White divided the clinical manifestations into eleven types, vesicular, scaling, macular, macerated, fissured, epidermophytides, papular, callous, keratotic, lichenified, and purpuric. The frequency is in the order mentioned, 382 cases being of the vesicular while only one was of the purpuric type. The vesicular form, responsible for 24.5

per cent of the author's cases, represents the type commonly known in this country as eczematoid ringworm of the hands and feet. More and more of the cases which used to be termed dysidrosis or cheiropompholyx are found to be of fungous origin. They form a very important group, because the affection produces a good deal of temporary disablement, though White thinks that this type of case is the most amenable to treatment. The scaling form, occurring in 23.1 per cent of cases, is most commonly observed on the sides of the fingers and toes as the primary lesion of the disease, the fourth interdigital space of the foot being the favourite site. Secondary scaling occurs in other forms of the disease.

The macular form, 19.6 per cent, is the type first described by Hebra under the name 'eczema marginatum', and is the variety most frequently referred to in this country as 'dhubie itch'. It is seen chiefly on the upper inner thighs, and is generally symmetrical. It may spread on to the scrotum, perineum, and intergluteal fold, and also on to the pubis, the hairs never being involved. The penis, including the glands, and the labia majora may also be attacked. In more severe cases the axillæ, umbilicus, and submammary regions may also be affected. It is occasionally seen on the back of the hands and feet, and the author has even observed it on the scalp. Finally, it is possible for the whole body to be more or less affected. The macerated form, 10.2 per cent, is the type most commonly seen on the webs of the fingers and toes, in the gluteal cleft, in the folds of the thighs, and in the submammary folds. The sodden appearance of this condition in the fourth interdigital space of the feet is well known, and in this situation the fungus was first demonstrated by Whitfield. The fissured form, 7.2 per cent, is really only a more severe type of the preceding in which cracks appear in the depth of the affected folds, but fissures may appear when the thick skin of the palms and soles is attacked. The papular form, 3.3 per cent, occasionally occurs where cutaneous surfaces oppose one another, but is also occasionally seen on free surfaces. In the latter the papules are of medium size, rounded, closely aggregated, free from scales, and are the colour of the skin.

The callous form, 3.3 per cent, occurs in its most marked form on the soles, but also, though in a less severe form, on the palms. Marked thickening of the horny layer, often with deep cracks, is its characteristic feature. The keratotic form, 3 per cent, is also found on the palms and soles. The lesions are round symmetrical keratoses somewhat suggesting arsenical keratoses in appearance. The lichenified form, 1.7 per cent, is really a type in which lichenification from friction has been superimposed on the original disease: it is seen chiefly in the macular type. In the purpuric form, 0.06 per cent, we have also the added phenomenon of minute subcutaneous hæmorrhages occurring in an affected patch. The nails were involved in 23 of White's cases, and showed various changes such as thickening, opacity, dirty greyness or yellowness, vertical striation, friability, disintegration and separation of plate from bed, or subungual hyperkeratosis. Epidermophytides, that is to say generalized eruptions due to absorption from the affected patches, occurred in 3.1 per cent of cases. They were generally of the maculo-squamous type. In one case the eruption was very widespread, involving the buccal mucosa, and was associated with sore throat and general lassitude.

White discusses the treatment at length, and he rightly lays great stress on the infectivity of the condition. Patients should only wear boilable material next the skin, and all articles which have come in contact with affected areas should be boiled separately from the rest of the household linen, and then hung up inside-out in the sun for a whole day (as he is not convinced that boiling alone kills the fungus); the use of paper towels, running water, and

liquid soap is encouraged, and shower baths are to be forbidden unless the affected feet are covered in cotton stockings. The affected parts should be kept cool. Of all the substances he has used, he gets the best results with a 2 per cent aqueous solution of *Mercurochrome-220 Soluble*. This is applied by means of a sterile swab once a day at first and subsequently twice a day. No bandages are allowed. The drug has a marked drying effect, and after some days may cause fissuring; if this occurs, the drug should be stopped for a few days until the fissures are healed. As improvement occurs it can be used less and less frequently, but should be continued for a month after disappearance of all lesions.

In the same discussion F. D. Weidman gave an exhaustive account of his researches into the etiology and pathology of this condition which cannot easily be summarized here. He has, however, made some important observations on the viability of the fungus. As a result of investigations by himself and others, he has come to the conclusion that dried ringworm fungus may survive outside the body from six months to a year. He has also found that the majority of ringworm fungi were killed in ten minutes at a temperature of 48° C., which suggests that sterilization of infected material should not be so difficult a matter as with bacterial infection. It has also led him to suggest the possibility of the application of heat locally as a means of treatment, though so far he has obtained no practical results. He further finds that ringworm fungi do not grow so readily in the presence of bacteria, and he has tried to inhibit the growth of fungus in the skin by application of yeast cultures. So far he has obtained no definite results.

Oidiodermatitis of the Nails.—In last year's *MEDICAL ANNUAL* (p. 452) a description was given of thrush infections. Little was said about thrush infections of the nails. Recently, however, J. A. Scott⁹ and H. MacCormac¹⁰ have published cases of this condition. Scott records a case of a woman of 35 in which there were greyish-yellow patches under the affected nails, which were only slightly raised from the nail-bed and very little thickened. Only the middle third of the diseased nails was affected. No lesions were present round the growing edge of the nails. MacCormac reported two cases in sisters 65 and 64 years of age respectively. Both these patients had recurrent attacks of swelling of the nail-fold for some years, with intervals from a few weeks to many months. The nails were shed from time to time. Both these observers were able to obtain growths of *oidium* from these; in Scott's case the exact variety was not identified, but in MacCormac's cases the *Oidium (Oospora) albicans* was grown. These cases proved very resistant to treatment. (Plate XXXII.)

REFERENCES.—¹*Soc. d. Sci. méd. de Montpellier*, 1925, June 5; ²*Presse méd.* 1926, March 16, 339; ³*Brit. Jour. Dermatol. and Syph.* 1927, Aug.-Sept., 351; ⁴*Ibid.* 1926, Dec., 492; ⁵*Ibid.* 1927, Aug.-Sept., 354; ⁶*Brit. Med. Jour.* 1927, ii, 261; ⁷*Ibid.* 1926, ⁸*Arch. of Dermatol. and Syph.* 1927, April, 387; ⁹*Brit. Jour. Dermatol. and Syph.* 1927, March, 119; ¹⁰*Ibid.* 1927, Oct., 394.

SKIN GRAFTING.

Sir W. I. de C. Wheeler, F.R.C.S.I.

C. A. McWilliams¹ discusses full-thickness skin-grafts. He advises the fat to be removed from the under surface of the graft not with a scissors but by a sharp knife. The technique of making full-thickness grafts is more exacting than the making of Thiersch grafts. The grafts should be free of fat, and should be cut the same size—no larger—as the raw area to be covered. This preserves the normal tension of the skin and the capillaries are kept open. The grafts should be sewn to the edges of the wound, so as to maintain the normal tension. Pressure should be applied, and for this purpose a rubber balloon invented by Ferris Smith, to incorporate with the dressing, is advocated.

PLATE XXXII

OIDIOMYCOSIS OF THE NAILS

(SCOTT AND MACCORMAC)



Fig. A.—Scott's case.



Fig. B.—MacCormac's case, due to *Oospora albicans*.

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There is no limit to the size of the graft which may be successfully transplanted. The full-thickness graft frequently remains mobile on the deeper parts,

S. L. Koch² gives details for the covering of raw surfaces, with particular reference to the hand. In covering defects of the hand, the use of thick grafts is essential to avoid subsequent contraction. Pedicled flaps give the most certain assurance of success, and permit the utilization of subcutaneous tissue. If subcutaneous tissue is still present after resection of the scar tissue—and this happens not uncommonly after the removal of contracted palmar scars—one may use a free thick graft and secure an entirely satisfactory result. Thiersch grafts are usually secured from the outer and front portion of the thigh or from the arm. Excessive granulations are shaved with a sharp knife from the raw surface to be covered, and pressure is maintained until oozing has stopped. When the raw surface is covered by the grafts, a single layer of muslin bandage, impregnated with sterile vaseline containing 3 per cent of xeroform, is laid smoothly over the grafts. Four or five thicknesses of gauze are laid over this, and over the gauze marine sponges are applied which have been soaked in 1-1000 mercuric chloride rinsed in sterile water, and wrung dry. A firm pressure bandage binds the sponges in place and maintains an even pressure over the entire surface. The dressing is left untouched for about a week. If necessary they are changed daily thereafter, and sponge pressure reapplied with each dressing. No method, such as open-air dressing, gutta-percha strips, waxed or paraffin gauze, has given as uniformly successful results as the type of dressing described. Uniform pressure, maintained for from fourteen to sixteen days, is the most important factor in the successful after-care. Free full-thickness grafts permit the entire raw surface to be covered at one operation. The writer does not use these grafts on granulating surfaces. They are used to cover fresh, raw surfaces left by resection of scar tissue, etc. After resection of palmar scars and forced extension of the fingers a wide defect often results. An exact pattern of the raw surface to be covered is made with sterile tinfoil, waxed paper, or gutta-percha. The pattern is laid on the thigh or abdomen and outlined with a sharp-pointed knife. The graft is raised by keeping it under tension and cutting with a sharp scalpel. It is sutured accurately in place by anchoring it with a few interrupted horsehair sutures. Before the suture is quite completed, a pair of narrow-bladed artery forceps is slipped under the graft, and a number of small perforations are made with a sharp-pointed knife in the skin raised by the open forceps. When in position the grafts should be under slight tension. If the graft has been laid on the palmar surface of the hand or fingers, the hand is strapped upon a prepared splint with the fingers in complete extension. If the graft is upon the dorsum of the hand, the fingers are flexed over a roll of gauze. Sponge pressure should be maintained for three weeks. The chief advantage of pedicled flaps is that they can be transferred with the attached subcutaneous fat.

Staige Davis³ sums up an interesting paper with the following results: The question is constantly being asked, "What is the percentage of takes in this or that type of graft?" This is a difficult question to answer, and would be easier if it were put in the form of "What are the ultimate results?" *In whole thickness grafting*, it is seldom that we have a complete failure if the graft is properly placed on a surface in suitable condition, and is immobilized with an appropriate dressing. The epithelial layer will in some instances remain intact, in others there is more or less loss of this layer. Sometimes only the corium or a portion of the corium remains, but eventually even if only a portion of the corium remains, the result will be good.

The results with 'small deep grafts' are uniformly satisfactory if the granulations on which they are placed are healthy and in good condition, and if the

grafts are not damaged in the cutting and are properly applied and immobilized. *The results with Reverdin grafts* are equally successful as far as healing is concerned, but the ultimate results on a granulating wound are never as good as those obtained with 'small deep grafts'. *Ollier-Thiersch grafts* take readily on a suitable surface, but what seems to be an utter failure at the first dressing will often later give a satisfactory result. The entire thickness of an Ollier-Thiersch graft may live; then again the superficial layers may become macerated. The development of a thin layer of fat under whole-thickness grafts, which is well marked after about three weeks, makes these grafts less liable to adhere to the underlying tissues and consequently more freely movable. Brownish pigmentation may occur in all types of grafts after healing is complete, and although various suggestions have been made to avert this, he knows of no procedure by which pigmentation may surely be prevented.

[The reviewer (W. I. de C. W.) removes skin grafts for the most part under local anæsthesia, and finds that infiltration of the skin with novocain and adrenalin does not interfere with its vitality when applied to a distant part.]

J. F. Grattan⁴ writes an interesting account of a new triple technique for reducing disfiguring scars to a degree of invisibility. The three stages are: (1) Excision of the original scar, followed by reapproximation by accurate subcuticular suturing with celloidinized silk. (2) X-ray treatment of the new hair-line scar to prevent over-repair and promote absorption; this is commenced immediately after the removal of the subcuticular suture, about the tenth or twelfth day after its insertion; accordingly, the first X-ray treatment is given on the fourteenth day. The first treatment consists of one-half skin unit, unfiltered (eight inches skin distance, five-inch spark-gap, sixty seconds). The second treatment consists of one-fourth skin unit, unfiltered, in seven days (same setting of machine, thirty seconds). The third treatment consists of one-fourth skin unit, unfiltered, in ten days. The foregoing schedule permits one full skin unit, unfiltered, in the first month following the operation. The fourth treatment is given after a fourteen-day-rest period. It consists of one-half unit, filtered through 1 mm. of aluminium. The details of the fifth and sixth treatment are mentioned. The entire X-ray therapy covers two months. (3) The third part of the triple technique is acid treatment of any elevations in or around the remains of the hair-line scar, to effect levelling and to eliminate shadowing. Trichloroacetic acid is recommended. It levels down surface irregularities by scabbing. A wire probe is dipped in the deliquescent fluid of the pure trichloroacetic crystals, and the acid is spread over the elevation only. As soon as the surface of the treated area turns a dead white, cotton saturated with cold water is spread on in a thin transparent sheet. If so applied, the cotton will stick without being held in place. It is left in position for five minutes after the sting of the acid has subsided. The white acid-treated area remains so for two days, and then gradually discolours into a typical brown scab. This separates itself at its edges and should be permitted to curl itself off gradually with little or no mechanical urging. Further applications of 50 per cent solutions and a final application of 10 per cent solution may be necessary.

A Method of Fixing Hooks to Adhesive Strapping.—R. E. Kelly⁵ says that Alexis Carrel, in his book on the treatment of infected wounds, described a method of closure of a granulating wound by elastic traction. To the edge of a piece of adhesive strapping he fastened a series of shoe-hooks by the instrument commonly used by shoemakers. Around these hooks he passed in a criss-cross fashion an elastic ligature. When this was pulled tight the edges of the wound approximated. The great advantage of this method over the usual 'strapping' of a wound is that the adhesive material need not be removed

each time the wound is dressed. The only disadvantage is that the shoemaker's hooks and instrument for inserting them are rarely available. Kelly has used the hooks of the domestic hook-and-eye variety. To sew the hooks on to adhesive strapping is a laborious and annoying business, but by the method here figured any number of hooks may be firmly fastened in a few moments. A strip of strapping is folded longitudinally, but not quite in the middle line, leaving the sticky side out. A tiny nick with the scissors is made in the fold (*Fig. 82*), but only just large enough to allow the hook, but not the flattened circles, to be pulled through. A second piece of strapping is placed over the first, as in *Fig. 83*, sticky side downwards. The dotted lines indicate the adhesive sides in both pieces of strapping. When enough hooks have been inserted, the armed strapping is fixed to the skin parallel with, and about $1\frac{1}{2}$ in. from, the edges of the wound. The hooks are then laced, as in *Fig. 84*. It is not necessary to use an elastic ligature. A piece of silk serves admirably, and slides smoothly through the hooks.

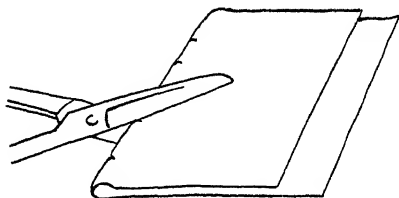


Fig. 82.

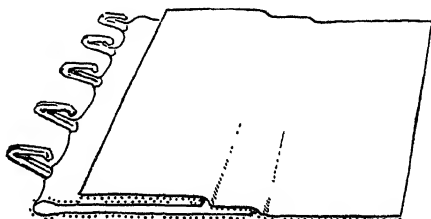


Fig. 83.

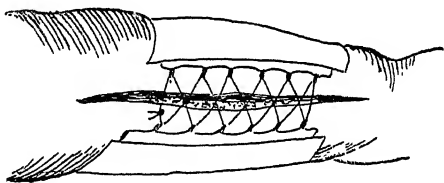


Fig. 84.

REFERENCES.—¹*Ann. of Surg.* 1926, Aug., 237; ²*Surg. Gynecol. and Obst.* 1926, Nov., 677; ³*Ibid.* 1927, Feb., 181; ⁴*Jour. Amer. Med. Assoc.* 1927, Feb. 26, 638; ⁵*Brit. Med. Jour.* 1927, 1, 462.

SKIN SENSITIVENESS TO LIGHT.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

H. W. Barber, F. D. Howitt, and F. A. Knott¹ have investigated a number of cases which showed light sensitiveness, and have made some very interesting observations. They divide their cases into two groups, the juvenile and the adult. As regards the *juvenile group* they were able to find porphyrins in the faeces in 3 out of 5 of their cases, and in the urine in 2 of these. (None of these were cases of well-marked hæmatoporphyruria congenita, nor had they the severe type of hydraea vacciniforme usually associated with this condition, but were cases of less severe hydraea). The porphyrin in these cases was not influenced by diet. The authors point out that porphyrins in the urine fluoresce with ultra-violet light in a very marked degree, and can be detected more readily by this means than by the spectroscope. They consider that the presence of porphyrin in these cases is due to some inborn error of metabolism, and are mild examples of the better-recognized cases of hæmatoporphyruria congenita. In the *adult cases*, in which clinical features were those of Hutchinson's summer

prurigo or solar dermatitis, they were unable to trace any definite evidence that the sensitiveness of the skin to light was due to porphyrin. They found almost constant evidence of unusual flora in the faeces, of intestinal stasis and gastric hypochlorhydria, and they are of the opinion that the sensitizing agent is either a decomposing product of protein metabolism or (more probably) a bacterial toxin, which, acting upon the cells of the epidermis themselves, renders them hypersensitive to light. As regards the rays to which these skins are most sensitive, they consider that, in this latter group of cases, rays with wave-lengths between \AA 3400 and 4400 are the most potent, but when some abnormal sensitizing agent such as porphyrin is present, as in the former group, rays of longer wave-length are more probably involved.

REFERENCE.—¹*Guy's Hosp. Rep.* 1926, July, 314.

SKIN, STAPHYLOCOCCAL INFECTIONS OF.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

A. Kissmeyer¹ recommends a special method for treating *furuncles*. The boil, whether ruptured or not, is cleaned with alcohol or tincture of iodine and then painted with pure Ichthylol, an area of two centimetres round being included. A small pledget of cotton-wool is then applied and the ichthylol is allowed to dry, which it does rapidly. The next day the dressing is bathed away with tepid water and then renewed. The boils usually disappear rapidly. Large furuncles may be punctured with the Galvano-cautery, but should not be incised. G. B. Dowling² also recommends Kissmeyer's method of treatment for boils. He has also found the Antistaphylococcal Anti-virus, prepared by the Besredka method, useful in treating various staphylococcal skin infections.

E. M. Livingstone,³ dealing with the treatment of *carbuncles* in the posterior cervical region, considers Fixation of the head and neck essential for their rapid healing. He has devised a special form of plaster splint for this purpose. He also advocates surgical removal of the necrotic mass and closure of the wound by sliding skin flaps as soon as granulations form. He utilizes a double crucial incision. The wound, after removal of the necrotic mass and before closure of the flaps, is treated by dry heat by means of an ordinary electric bulb fixed in proximity to the wound.

E. Melchior⁴ favours Operative Treatment in all cases of *furuncle of the face*. Although he admits that the conservative method is successful in a large number of cases, he claims that it is impossible to determine the malignancy of the lesion, except when there is severe involvement of the general health. He therefore claims that all cases should be treated potentially as of the malignant type by operative measures. He denies that incision is harmful unless it is not done thoroughly enough. Although in 37 cases treated by operation there were 4 deaths as against 1 death in 36 cases treated conservatively, he considers it would be erroneous to conclude that conservative measures were superior to operation, because no very severe cases were included among those treated without operation.

REFERENCES.—¹*Munch. med. Woch.* 1927, 282, and *Ann. de Derm. et de Syph.* 1926, May, 297; ²*Med. Press and Circ.* 1926, Nov. 10, 380; ³*Ann. of Surg.* 1926, Nov., 663; ⁴*Beitr. z. klin. Chir.* 1926, 681.

SKIN, ULCERS OF. (See also VARICOSE VEINS AND ULCERS.)

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

C. White and F. D. Weidman¹ have called attention to a condition of *pseudo-epitheliomatous hyperplasia* at the margins of cutaneous ulcers. This condition is not unknown but has not been so clearly described before. They stress first the character of true epithelioma, giving first place to the embryonic

character of the epithelial cells; the nucleus is large, hyperchromatic, and well chromatinized; the cytoplasm has a rounded-off contour, its substance is more hyaloid than normal; there is absence of vacuoles and oedema. Secondly, they refer to depth of penetration of the epithelial pegs. They point out that this may be considerable, even to the level of the sweat glands, in non-neoplastic dermatoses such as eczema, but they do not think benign growths ever penetrate deeper than this level. As adjuvant features they mention invasion of the basement membrane, mitotic figures, and epithelial pearls, but point out that none of these alone constitute conclusive evidence of malignancy. Turning to pseudo-epitheliomatous hyperplasia they describe three grades: (1) The type of hyperplasia seen in eczema of a high grade. In such cases the pegs may reach almost to the sweat glands, but embryonic cells are missing and there is no suspicion that the basement membrane is broken. (2) In this group the features are the same as in the preceding, but in some places the basement membrane is so indefinite that it may even be regarded as broken. At such positions the epithelium may be of an embryonic character nearly or quite that of genuine epithelioma. They may be pearls, and the interpapillary pegs may be excessively irregular in form. There is, however, no extensive streaming of cells through the broken basement membrane, and no notable deep extension. (3) Appearances in this group are similar to those in epithelioma; the only circumstances keeping such cases from the unqualified epitheliomatous cases are the clinical ones such as absence of metastasis or cachexia. The authors conclude that in these cases there are definite limitations to the recognition of early cancer which are most unfortunate because they are so important to the patient. They think that the diagnosis of carcinoma at the margin of chronic skin ulcers is unjustified except when the infiltration extends to the level of the sweat glands or further.

REFERENCE—*Jour. Amer. Med. Assoc.* 1927, June 18, 1959.

SKULL, FRACTURE OF. (See HEAD INJURIES.)

SMALL-POX.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—Sir George Buchanan¹ states that the incidence of small-pox in England and Wales showed a progressive increase from 1921 to 1925, but during the first six months of 1926 this increase, though still continued, was less rapid. In striking contrast with the increased incidence was the low number of deaths. Out of about 5500 cases notified during the first six months of 1926 there were only 4 deaths, whereas there were 5 deaths among the 343 cases notified in 1921. The cases were most numerous in Durham, whence the disease spread to Northumberland in the North, to Yorkshire in the South, and then to the adjacent counties of Derby and Nottingham. In Warwick, Northampton, and Wales there were only sporadic cases. In striking contrast with this mild character was the outbreak reported at Minneapolis by S. E. Sweitzer and K. Ikeda.² It persisted throughout the whole of 1924 up to September, 1925, during which time there were 1430 cases with 365 deaths, or a mortality of 25.5 per cent. In none of the fatal cases had vaccination been performed successfully within the last seven years.

SYMPTOMS AND COMPLICATIONS.—E. Giraud³ records a personal case, and has collected 43 other examples from the literature, of recurrent small-pox, which he divides into two distinct groups. In the first, which consisted of 5 cases, a discrete first eruption was followed by an intense second attack which was fatal in 3. In the second group, which consisted of 36 cases, a typical first eruption was followed by a milder second attack. In 8 cases a third and still milder attack ensued, and in 2 instances there were four or

five successive eruptions. The interval between the eruptions in the 43 cases ranged from three to thirty days. Cases of this kind suggest that there is more than one form of small-pox virus, and that in addition to the ordinary form of the disease there is a slightly different variety which readily gives rise to recurrences.

E. J. Huenekens and L. Rigler¹ report the first case on record of *osteomyelitis variolosa* occurring during the acute stage of small-pox. The patient was a boy, age 4 years, who eight days after the appearance of the eruption developed swelling and tenderness of the joints in both arms and legs, and a week later complained of pain in the neck, which was stiff and tender. X rays showed a symmetrical widespread destructive process at the epiphyseal line of the long bones and in the first cervical vertebra, which became dislocated, although this did not cause any serious symptoms. The acute condition of the bone continued for two months after disappearance of the eruption. Repair finally took place with almost complete recovery except for dislocation of the first cervical vertebra.

W. L. Tullis² reports a case of *erythema nodosum* following a mild attack of small-pox in an unvaccinated girl, age 6 years. This was the first example of this condition which he had seen in a series of 1900 cases of small-pox.

R. E. Wilson and F. R. Ford³ classify the recorded cases of *nervous complications* of variola in the following three groups: (1) Cases of paralysis of the legs without any other symptoms, suggesting an involvement of the anterior cells of the spinal cord. Death occurred in all but one case from bed-sores, urinary infection, or respiratory paralysis. (2) Cases with bulbar symptoms, such as dysarthria and disturbances of swallowing. None of these patients died, and most made a substantial recovery. (3) Cases with signs of a more diffuse process in the nervous system, including spastic weakness, tremor, ataxia, bulbar disturbances, and in some instances mental changes. The early and fairly uniform appearance of nervous symptoms in this group suggests that they are due to the virus of variola and not to secondary infection. Autopsies, which were only performed on cases with spinal symptoms, showed either no changes at all or areas of inflammation and degeneration.

REFERENCES.—¹*Bull. de l'Office Internat. d'Hyg. Publ.* 1927, 344; ²*Arch. of Dermatol. and Syph.* 1927, xv, 19; ³*Gaz. des Hôp.* 1926, 1413; ⁴*Jour. Amer. Med. Assoc.* 1926, lxxvii, 295; ⁵*Lancet*, 1927, i, 654; ⁶*Bull. Johns Hop. Hosp.* 1927, xl, 337.

SPINAL CORD, SURGERY OF.

Geoffrey Jefferson, M.S., F.R.C.S.

The Lettsomian Lectures of 1927, delivered by Donald Armour,¹ constituted a valuable addition to the literature of the surgery of the spinal cord. The early history of spinal operations is well pictured, recalling the fear of exposure to air, so fatal an element, which mightily delayed the development of surgery for the relief of spinal conditions.

Armour pays particular attention to the more surgical methods of cord diagnosis (lipiodol, etc.), to serous meningitis, telangiectasis of the cord, and to operations for the relief of pain; the sections well repay study. He describes the operation of longitudinal median splitting of the cord to arrest pain in a localized area, an area which will correspond to the length of the medullary incision just as the extent of a syringomyelic cavity in the cord determines the extent of the analgesia characteristic.

It is interesting to reflect that this operation, which was suggested by Greenfield and performed once by Armour, was done on animals by Galen and much later by Brown-Séquard. It was indeed this experiment which helped the last named to establish the crossing of pain fibres in the cord. The operation requires very accurate performance, and is not yet standardized, though anatomically and physiologically correct.

Lipiodol.—The advisability of using lipiodol as an aid to the correct localization of spinal tumours was discussed in the MEDICAL ANNUAL of 1927. Armour's views seem to coincide closely with the opinions expressed there. He calls attention to a 'sensory-lipiodol' dissociation, by which he means that the clinical investigation of sensation reveals a certain level whilst the lipiodol gives a shadow opposite a lower or higher segment. In such cases the lipiodol level is the more likely to be correct. Armour describes a case in which laminectomy at the correct sensory level failed to disclose a tumour which was found at necropsy a vertebra lower. The use of a coloured fluid injection might have led to immediate reorientation, but some experience with the normal flow of the injected fluid and its variations is necessary before one can be sure of correct interpretation of what is taking place before one's eyes. If the tumour is above the exposed level, compression of the jugulars will not lead to the flow of cerebrospinal fluid which normally follows this step (*see* MEDICAL ANNUAL, 1927, p. 461).

As to the danger of lipiodol injection there is little new to add. No fatality or serious aggravation of a cord condition has yet been placed on record, though minor disturbances are not unusual. At the National Hospital, Queen Square, the following, according to Armour, have been the chief sequelæ (and the experience of most who have used lipiodol coincides): (1) Increase in root pains at the site of lesion, duration some hours; (2) Soreness and stiffness of the back muscles; (3) Headache, transient; (4) Rise of temperature to 101° or more, duration a day or so. Pleocytosis of the cerebrospinal fluid is the rule, but no harm seems to come of this mild chemical leptomeningitis. The chief 'danger' of lipiodol is that it may pass by a small tumour and lead to mistaken diagnosis.

Spinal Tumours.—Whilst spinal tumours are unquestionably much rarer than brain tumours, they ought to escape classification in the practitioner's mind as such rarities that he is not likely to meet with them in his own particular practice. There is no doubt that there is a tendency for the individual to adopt such an attitude towards certain maladies, and that he thereby runs the danger of developing what we may term a diagnostic 'blind spot'. It is a fact that the diagnosis of spinal tumour has become much easier during the past ten years, but it is also a fact that the newer tests of precision are not easily applicable in the patient's own home. The syndrome of slowly increasing pressure on the cord is as a rule so clear-cut that once it has been accurately observed it is not likely to be forgotten. And here we may observe that the one proper attitude to adopt is to suspect every case of spasticity of the lower limbs as a tumour-bearer until it is proved otherwise. Nowhere in the body are the results of operation more brilliant, more dramatic, than in the majority of cases of tumour of the cord, and it is a tragedy to deprive a patient of the benefit of surgery.

J. R. Learmonth,² in a comprehensive monograph based on 60 cases from the Mayo Clinic, describes the pathology, symptomatology, and diagnosis and surgery of the common form of extramedullary tumour which lies inside the dura. These he terms leptomeningiomas on histological grounds. Believed in earlier days to be cancerous tumours (Cruveilhier), fibrous tumours, sarcomas of the dura mater, psammomas, and endotheliomas, Learmonth adduces reasons for believing that they commence in the arachnoidal buds from which originate the epithelial cells found in them. He discusses the origin of the arachnoid, and concludes that it is an epithelial structure. Usually a complete removal in one piece is possible; but if the tumour lies on the front of the cord it may have to be taken piecemeal. Naturally the cord must be most carefully respected. Division of one or more posterior roots may be necessary to free

the growth or to expose it satisfactorily, and it is far better to sacrifice roots than to run the risk of damaging the cord. Oftentimes the tumour will be adherent to the dura, and whenever possible the affected portion of dura should be excised to obviate danger of recurrence. In cases where the laminectomy fails to reveal a tumour which the operator has strong reasons to believe to be present, an injection of 5 c.c. of 1 per cent indigo-carmin into the lumbar theca may demonstrate to him the presence of a block below the exposed point and lead him to the correct level, either then or at another sitting. Learmonth discusses the physiology of bladder disturbance in spinal conditions; his conclusions on this point, and on the variability of the clinical signs according to the relation of the tumour to the cord, anterior, posterior, and so on, seem to the present writer to be open to criticism. The relative uniformity of the picture presented by these cases is most impressive, no matter what the location of the tumour is so long as it is not actually in the cord substance. This paper is in general a very constructive and helpful piece of work.

E. Sachs and M. Glaser³ analyse those cases of supposed spinal tumour in which operation has failed to reveal any such thing. There were 33 such patients in a series of 140 laminectomies for tumour. They divide their 33 cases into four groups: (1) Cord and meninges normal, 5 cases; (2) Cord normal, but meninges pathological, 9 cases; (3) Cord pathological, meninges normal, the myelitic or 'cadaveric' cord, 7 cases (these never improved after operation, whilst in the other groups amelioration up to complete disappearance of symptoms sometimes took place); (4) Cord and meninges both normal. Some of these patients were operated upon in earlier years and would not be touched in the light of the greater experience now acquired by the authors. They regard rapid onset of symptoms, a cerebrospinal-fluid cell count of above 10, and no consistent sensory level as contra-indications to laminectomy. It is noteworthy that lipiodol was used in only one case. It is just in these most doubtful cases that it is most useful.

Ledoux-Lebard and Piot⁴ advocate the X-ray treatment of spinal-cord tumours. Four cases were clinically cured by combined surgery and radiotherapy. Two were rather remarkable cases. In one a grey mass 4 to 5 cm. long was found opposite the third thoracic vertebra, but only a portion could be removed; histologically it proved to be a lymphosarcoma. Seven treatments were given, and nine months later, after a gradual improvement, he was able to walk about normally, and two and a half years later he considered himself cured. In another case an intramedullary tumour was displayed at the level of C 3 and was not interfered with. He had an incomplete tetraplegia which became complete after the operation, but seven months later, after two courses of intensive treatment, he was able to walk freely even on rough roads.

REFERENCES.—¹*Lancet*, 1927, i, 423, 533, 591; ²*Brit. Jour. Surg.* 1927, Jan., 397; ³*Jour. Amer. Med. Assoc.* 1927, Jan., 308; ⁴*Presse méd.* 1927, April, 465.

SPINE, TUBERCULOSIS OF. (See also TUBERCULOSIS OF BONES AND JOINTS.) John Fraser, Ch.M., F.R.C.S. Ed.

TREATMENT.—In reviewing the recent literature dealing with Pott's disease, it is apparent that operative treatment of an Osteosynthetic or Splintage type is increasingly favoured. The stage of novelty of the procedure has passed; there has been time to estimate and to evaluate the results obtained, and it would seem that there is an increasing consensus of opinion in favour of the adoption of the operation. In many clinics it has become, with certain restrictions, almost a routine measure.

The principles which decide the suitability of individual cases are well expressed in a communication by M. A. Guillemin¹ on thirteen cases of osteo-synthesis for Pott's disease by Albee's method. The report was communicated by Dr. Etienne Sorrel. Full case-histories are given, and the details of subsequent examination are added. The author insists that it is unwise to perform the operation on children, and the case records suggest that twelve years is the limit in age which this term implies. With these provisions no further allusion is made to the importance of age; the oldest of the recorded cases was 44 years. The situation of the disease does not materially affect the decision; undoubtedly the results in certain situations are better than those in others, but there is no barrier to operation in respect of site.

It is upon the question of the time at which the operation should be done that issue will be joined with Guillemin. He is evidently a supporter of the 'early' operation—early in respect of the time which the patient has been under observation; that is to say, if the decision to operate is arrived at, the procedure is put into practice a few days after the child's admission to hospital. Sorrel criticizes this attitude. He points out how important it is for the surgeon to be acquainted with two pieces of clinical information: (1) What is the type of the disease in respect of its progress? Is it spreading or is it localized? and (2) Are there evidences of other tuberculous lesions? These facts can only be established after careful investigation and observation. The opinion has been expressed by Duval and by Sorrel that it is a mistake to operate during the stage of an actively spreading disease; that it is wiser in this event to delay until conservative and tonic measures have improved the general resistance of the patient, and then to complete the cure by the operative fixation of the affected part. This is a point of great significance and importance, and if we fulfilled its observance more completely there would be fewer disappointments in our post-operative results. In the osteo-synthesizing operation we have an efficient method of fixing the spinal column, if we employ it at a time when the disease is localized by reactionary and ossifying changes in the affected tissue; but to proceed to temporarily devitalize by operative interference a part which is already the site of a spreading infection, and to expect that a graft will be capable of thereafter engendering the cure, is to misuse a valuable opportunity, and to expose to the possibility of disrepute a valuable and helpful procedure. In the light of these various considerations Sorrel criticizes Guillemin's cases, adducing facts and figures to substantiate his arguments.

A contribution on the results of the **Bone-grafting** operation is supplied by Lauwers² and reported by R. Proust. Nineteen cases are reported, and the operative technique was based on Halstead's method.³ This consists of an incomplete division of the spinous processes at their bases and the insertion of a flat graft into the space so provided, the spinous processes being levered to one side to permit of this. The procedure has the peculiar advantage that a rigid graft may be employed in angular deformities, the spinous processes being divided at different levels in relation to their individual spines, but in a straight line. The method is also available in scoliotic deformities. The rigidity and strength of the graft, together with the broad surfaces in apposition, make the method reliable and efficient. It is evident, too, that the mechanics of Halstead's method are sound, for the graft is not submitted to the tension and degree of leverage which the split-spine graft has to sustain.

In describing the post-operative treatment the excellent and necessary warning is repeated that, as Kopp has shown, continuity of structure between graft and host is rarely complete until one year has elapsed. The case results

are excellent; there was no mortality, in 18 cases out of the total of 19 a cure was recorded, in 1 case the condition remained stationary.

Halstead's operation, and the modification practised by Polya,⁴ are not widely practised in this country. Lauwers' paper has drawn attention to certain advantages which these operations possess over the more popular procedures.

Sorrel⁵ speaks with the authoritative weight of 112 cases on the indications for the technique and the results of osteosynthesizing operations on the spine. In speaking of the indications, he says: "As a principle osteosynthesis ought to be practised in all cases where a marked destruction of the vertebral bodies exists . . . and assuming that the welding between the partially destroyed bodies is not accomplished". On a pathological basis there are two types of disease in which he believes operation is contra-indicated—that in which only a minor lesion exists in the neighbourhood of a disc, and that in which fixation by new bone is already complete. Sorrel points out that in children early consolidation of the affected area is to be expected, and it is for this reason that operation in these cases is rarely indicated. In the adult, on the other hand, consolidation is a much slower process, and therefore the benefits of a synthesizing operation are correspondingly greater. Two further contra-indications are discussed—the general one, that where the patient is suffering from multiple tuberculous lesions which necessitate recumbency, the principal advantage of grafting (an early return to ambulation) is precluded; and the local one, where a prominent gibbus is covered with unhealthy integuments. He observes that the exercise of these indicatory principles excludes two-thirds of his cases from operation; for example, among 353 adults under treatment for Pott's disease in the Maritime Hospital, 101 were submitted to the grafting operation. The situation of the disease is not of material consequence where the question of operation is being decided, except that one must recognize that high cervical cases are difficult to 'fix', and there are risks in the attempt.

It is an important point in Sorrel's plan to delay operation until the patient has been under observation and treatment for at least one year, particularly if any signs suggest that the disease is active. This is sound practical advice, and the worth of the principle is beyond dispute. By it possible errors in diagnosis are to a large extent eliminated, an idea can be formed of the type of disease and the strength of the patient's resistance to it, and—perhaps more important than either of these considerations—consolidation is already proceeding, so that the burden borne by the graft is correspondingly lightened. The results are among the best which have been published—an indication in itself of the wisdom which has guided the choice of cases. No death has been reported, and only in 6 cases was there recurrence of disease—in 3 it took the form of the refilling of a tuberculous abscess, in 2 the development of a bone focus, in 1 a pulmonary lesion.

One feature of Sorrel's technique is interesting—the spinous process is not split centrally but laterally, so that only a small segment of the process is displaced.

Operative Technique.—Two modifications of technique are contributed in recent literature. Professor Fritz Lange⁶ contributes an article from the Royal Bavarian Orthopaedic Clinic of Munich, on the operative splinting of the vertebral column. Splints of celluloid or of rustless steel are used; the spinous processes are exposed over the desired area, and separated from the overlying soft tissue until the posterior surfaces of the laminae are exposed; the spinous processes are drilled with a fine hole at their bases; the splints, carefully moulded to the requisite shape, are laid *in situ*, each in the spino-

PLATE XXXIII
WREDEN'S TECHNIQUE IN SPINAL TUBERCULOSIS

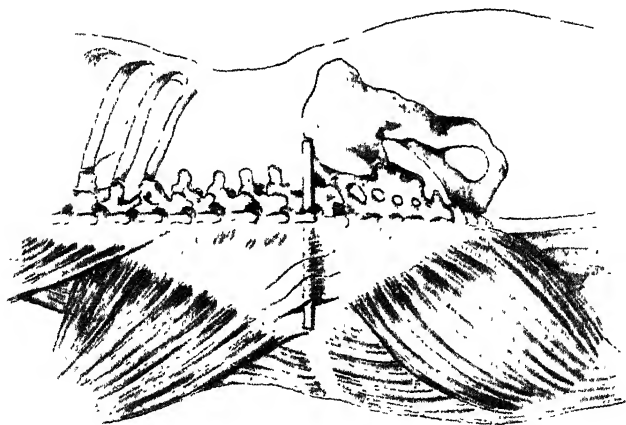


Fig. A.—Tibial graft in place, forming transverse supporting raft.
MEDICAL ANNUAL, 1928

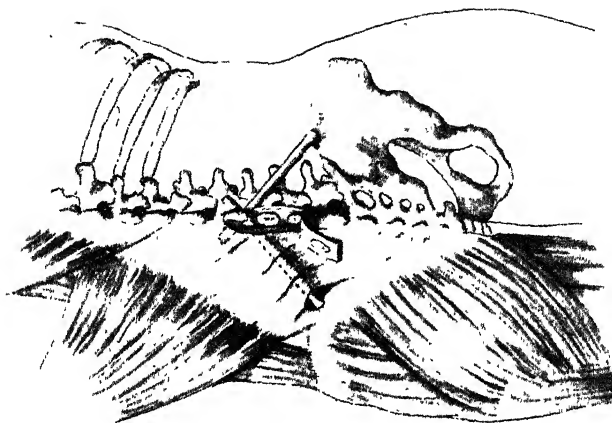


Fig. B.—Osseous grafts from tibial crests in place.
Re-drawn from 'Annals of Surgery'

laminar angle, and they are then fastened by a loop of silk thread which passes through the aperture in the spine. The soft tissues are thereafter united, and a plaster jacket is applied and worn for six weeks. The patient is then fitted with a corset and allowed to get up, the corset being worn for two years. Since 1926 Professor Lange has used one splint of rust-proof steel on one side and a celluloid splint on the other.

There are many points upon which this technique may be criticized, but without actual experience of the method, and without an opportunity of seeing Professor Lange's results, it would be unfair to be too critical, though one may reasonably ask whether either steel or celluloid is capable of producing the periosteal reaction and the bone regeneration which is such an important part of the benefit afforded by a bone-graft. Experimental work would indicate that these substances have the reverse effect, and lead to absorption and rarefaction. If we read Professor Lange's argument aright, he relies upon the actual splinting action of the graft, but it is doubtful whether the mechanics of this claim are sound. The paper does not contain an account of the results of this operation, and, as far as we are aware, no information is available as to its employment in this country.

R. R. Wreden,⁷ of Leningrad, has attempted to evolve a technique by which the use of orthopædic corsets in the conservative and post-operative treatment of Pott's disease may be eliminated. It is a significant comment upon the economic condition of the Soviet Republic that the genesis of this technique has been the inability of the average patient to obtain this simple orthopædic appliance. The illustrations (*Plate XXXIII*) are descriptive of the principles upon which Dr. Wreden works. Through the medium of graft supports the superincumbent weight is transmitted from a spinous process above the diseased area to the iliac crests.

Again one can only criticize on a theoretical basis, but it would seem that the procedure does not take sufficient cognizance of the possibility of absorption of bone-grafts, particularly when these are embedded in soft tissue. It is doubtful if a graft introduced as Wreden suggests will exist for longer than six months; there is no available source from which its osteoplastic elements can be reinforced, while it is constantly open to invasion by phagocytes and osteoclastic cells. When one appreciates that the mechanical burden in this operation is infinitely greater than that borne by the ordinary bone-implanted graft, one must be sceptical of the practical value of the procedure. It is reported that ten cases have been treated on these lines, but no information is given regarding the efficiency of the results. One is left with the feeling that here necessity has verily been the mother of invention.

Heliotherapy in tuberculosis of the spine in children is discussed by Ghormley,⁸ who expresses belief in the value of heliotherapy as an efficient means of treatment. After discussing the difficulties in diagnosis and the value of various guides to the progress of cases, the view is expressed that calcification both in bone and abscess cavities is stimulated by heliotherapy. This conclusion has been arrived at by contrasting cases treated by heliotherapy with those in which this method has not been employed. Attention is drawn to the significance of Krause's work⁹ on "Allergy in Tuberculosis", and the hypothesis is put forward that the beneficial effect of heliotherapy is exerted by affecting the patient's allergy so that he becomes more resistant to the tuberculous infection.

REFERENCES.—¹*Bull. et Mém. Soc. nat. de Chir.* 1927, March, 365; ²*Ibid* June 18; ³*Surg. Gynecol. and Obst.* 1915, xxi, 15; ⁴*Zentralb. f. Chir.* 1921, xlviii, Jan. 25, 884; ⁵*Bull. et Mém. Soc. nat. de Chir.* 1926, Nov. 6, 922; ⁶*Surg. Gynecol. and Obst.* 1927, May, 608. ⁷*Ann. of Surg.* 1927, Jan., 35; ⁸*Jour. Amer. Med. Assoc.* 1927, Jan. 29, 289; ⁹*Trans 17th Ann. Meeting National Tuberculosis Association.*

SPLENECTOMY: THE MODERN INDICATIONS FOR.

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Indications for removal of the spleen may be divided into two classes, the mechanical and those in which the spleen is the seat of disease. About the first group there can be no argument whatever, unless it is as to whether a ruptured spleen should be removed or sutured, or a mobile spleen removed or fixed. It is when we come to consider the second group that differences of opinion are to be expected. It is rational to assume that those diseases which are primary in the spleen and are confined to the spleen should be cured by its removal; but we can go a step further than this and show that diseases which are not completely confined to the spleen, and even diseases which are present in other situations, may be improved or even cured by this operation.

In order to approach the subject in a comprehensive way it is necessary first of all to consider what are the known functions of this organ.

The Malpighian bodies give rise to lymphocytes. The modified endothelial cells of the spleen pulp may gather up solid particles suitable as food which are passing over them in the venous blood; they may separate from the mesh-work and wander among it, also gathering up solid particles, particularly effete red blood-corpuscles; or they may proliferate, and some of the later generations of cells to which they give rise may be thrown off into the blood-stream. The endothelial cells share one of the properties of all cells, that of making ferments, which, when they are thrown out into the blood of the splenic vein, meet the food-containing blood of the superior mesenteric vein.

During fetal life the spleen is actively engaged in the formation of red blood-cells, but this function ceases after birth. As has been already stated, a large amount of red-cell destruction goes on here, and the pigment of the blood is conveyed to the liver, not free but in phagocytic cells, where it is converted into bile pigment. The fact that after splenectomy the amount of bile pigment formed is reduced to one-half of the normal shows, firstly, that red-cell destruction goes on in the spleen, and, secondly, that it also goes on elsewhere.

It has been suggested that the spleen secretes a substance capable of acting on the bone-marrow. The rapid anaemia which occurs after a splenectomy suggests that a substance of this kind may be lacking, and it has been shown that an intraperitoneal dose of splenic extract will cause a rapid rise of red cells and of haemoglobin. As regards the white cells, a restraining substance which limits their production has been supposed to be present, and its absence after splenectomy held to be the cause of the resulting leucocytosis. Pearce, however, has suggested that it is the loss of a storehouse for iron which is to be blamed. It is certain that animals suffer from a loss of iron after splenectomy, and it is evident that red cells cannot be formed in the absence of iron.

The spleen may be looked on as taking an important but not an essential part in four important systems in the body: (1) The hæmopoietic system; (2) The reticulo-endothelial system; (3) The digestive system; and (4) The sympathico-endocrine system.

1. *As a Member of the Hæmopoietic System.*—The part played by the spleen in the formation of red cells and leucocytes in embryonic life is everywhere admitted. In adult life a return to this embryonic function is seen in leukaemia and in infections, in both of which conditions the spleen again begins to manufacture white cells, in one case as the result of an unknown and in the other of a known stimulus. The possible influence of the spleen on the bone-marrow has already been discussed.

2. *As a Member of the Reticulo-endothelial System.*—This system, which was first suggested by Aschoff, consists of the spleen, the star-cells of Kupffer in

the liver, the endothelial cells of the lymph glands and the bone-marrow, etc. The splenic pulp cells have the power of taking up certain 'vital' dyes; they are phagocytic, and the vitality of the ingested organisms accounts for the latency of many infections. The malarial parasite and the *Spirochaeta pallida* exemplify this. These phenomena are not confined to the spleen alone. When hæmolyisin is administered, pigment is found scattered in all those organs in which the reticulo-endothelial system occurs. The relation of the spleen to immunity is not merely a matter of its behaviour to the introduction of hæmolyisin; its pulp-cells are concerned in the manufacture of the immune substances with which the body is furnished in the course of infections. This opinion receives confirmation from the enlargement of the spleen which occurs in the course of acute infections. The evidence of the defensive properties of the spleen, as shown by experiment, is so strong that remembrance of this function should always be borne in mind when the operation of splenectomy is under consideration.

3. *The Spleen as a Member of the Digestive System.*—It is known that the spleen undergoes variations in volume during the day, becoming larger up to a period four hours after a meal. It has been suggested that the action is mechanical. Less blood passes through a small organ immediately after food is taken, and therefore more blood is available from the parent celiac axis for distribution to those of its branches which supply the stomach. On the other hand, it may be that the enlargement is connected with the leucocytosis which is known to occur during digestion.

4. *As a Member of the Sympathico-endocrine System*—that is to say, an organ which produces an internal secretion which exerts its action through the central nervous system. The sympathetic nervous connections of the spleen are very intimate, and it has been shown experimentally that extracts of spleen cause contraction to take place in smooth muscle. 'Hormonol' is such an extract prepared commercially. It has been suggested that there is a close connection between the spleen and the thyroid and thymus glands.

We may now turn to an individual consideration of those conditions in which splenectomy should be performed.

Mechanical Conditions.—

Rupture.—Apart from the very rare cases when the spleen is completely avulsed and the splenic vessels are completely torn across—cases which are fatal in the course of an hour or two—splenectomy gives extremely good results, the recovery-rate being approximately 90 per cent. In the usual type of case the patient shows at first the signs of profound shock, which only partially passes off, and is succeeded by, or passes gradually into, the state associated with a severe concealed hæmorrhage. The signs of these two conditions are at times extremely difficult to distinguish, probably the most constant and the best sign being a gradual increase in the pulse-rate. Locally it will be found that the site of injury has been in the neighbourhood of the spleen, that the abdomen in this region is tender and perhaps somewhat rigid, that there is a little distention, and that shifting dullness is present in the flanks. Ballance points out that the dullness on the right side can be made to shift, while that on the left is fixed, and Kehr has drawn attention to pain referred to the left shoulder. In those cases which we have seen, the dullness has been in the suprapubic region and has extended up the left side, while the right side has been clear, or at least the area of dullness there is very much smaller. In this way we may come to the conclusion that the patient has a rupture of the spleen, or that we are dealing with an intraperitoneal hæmorrhage probably from the spleen. When this diagnosis is made, there can be no question but that the

treatment is immediate operation. Delay is fatal; we must not wait for shock to pass off: that has already happened before the diagnosis is made, and with every hour we wait the patient's chance of recovery becomes less. Gas-and-oxygen anæsthesia is sufficient to control those exsanguinated patients in whom the removal of the spleen presents no technical difficulties. One word of warning is necessary: make certain that the whole of the organ has been removed and that a small detached portion with its supplying vessel, from which the bleeding would continue, has not been left behind. Suture of the injured spleen and gauze packing have both gradually given way to the more certain operation of splenectomy. The success or otherwise largely depends on the after-treatment. The infusion of saline, or if possible of blood, should be commenced as soon as the pedicle is ligatured. Other anti-shock measures are vigorously employed until the patient is out of danger.

Movable Spleen.—This condition is occasionally met with as part of a general visceroptosis; or it may occur in cases where the spleen is enlarged and its weight has stretched the supporting phrenico-colic ligament. It has given rise to severe attacks of abdominal pain, similar to those encountered in a movable kidney. Owing to the close ligamentous attachments between the spleen and the stomach, gastric disturbances are to be expected. Harris records a case of a movable spleen, lying in the pelvis, which became twisted, and as a result of the consequent swelling was impacted there and caused intestinal obstruction from pressure on the rectum. In the milder types of a movable spleen, relief may be obtained by a well-fitting abdominal belt. Splenopexy has been performed; but in the more severe cases removal of the organ is justified, and, on account of the ease with which the pedicle is dealt with, can be done at no great risk.

Torsion of the Spleen.—This condition, as just mentioned, is liable to occur where the organ is prolapsed. The pedicle is twisted, the blood-supply cut off, and as a result the spleen becomes swollen. Later on, gangrene and eventually a general peritonitis results. The diagnosis is not easy, particularly if the presence of a mobile spleen had not been observed previously. A tumour will be present, and will be associated with abdominal pain and vomiting. Relief of the strangulation and fixation of the spleen has been advocated, but its removal must be looked on as the method of choice.

Prolapse of the Spleen.—Some of the earliest references to the spleen in the literature deal with cases where the spleen has prolapsed through a wound in the abdominal parietes. Two such accidents are referred to as occurring in the latter part of the seventeenth century, and in both of them it was followed by recovery. This must be a rare type of accident at the present time, even if we include the injuries which occur in war time. Splenectomy can only be considered sound in cases when the spleen is lacerated or badly infected. In other cases it may be cleaned and returned, with or without drainage.

Gunshot Wounds of the Spleen.—These injuries were noted during the late war, but in most cases were complicated by injury to other structures, particularly the left kidney and the splenic flexure of the colon. The local collection of blood seen in cases of rupture has not been commented on, most cases being discovered on opening the abdomen after the bleeding had ceased. It has been recommended that the spleen should not always be removed in these cases, as its removal may prolong unduly an operation which has to deal with the associated injuries. If suture is undertaken, the danger of a recurrent hæmorrhage must be borne in mind.

We now come to the consideration of the second group of cases where the spleen is the site of disease.

Malaria.—There is an enlargement of the spleen, which, on account of its size, the fact that it may prolapse or cause pressure on the other organs, or because of its liability to rupture from a trivial injury, is a source of discomfort or danger to its owner. It has also been stated that to 'remove the spleen is to remove the breeding-place of the parasites'. Removal of the spleen is attended by an alarming mortality, but Vanverts has divided the cases into those which are fixed and those which are mobile. In a series of 39 of the former cases, 28 died; whereas in 35 of the latter, only 2 ended fatally. Splenectomy is only to be advised in those cases where the spleen is freely movable or where, from the nature of the patient's occupation, there is a liability to injury which might cause it to rupture.

Pernicious Anæmia.—In considering the advisability of removing the spleen in cases of pernicious anæmia, we must turn for a moment to the pathology of that disease. Anæmia may be caused by either a diminution in the output or an increase in the destruction of red cells, or perhaps by both. Conditions causing the first type of anæmia are seen in cachexias, wasting diseases, tumours, etc., while an increased destruction of red cells is seen in hæmorrhage, in hæmolytic jaundice, and in hæmolytic poisons. It is in this second group that we must include pernicious anæmia. There is in this disease an excessive red-cell destruction, with an increased demand on the blood-forming tissues, rather than a failure to meet the normal red-cell demand. The bone-marrow is profoundly influenced by the hæmolytic poison, and is thus subject to a double stress: it is being called on for an increased output at a time when it is struggling against the effects of the poison. The result is that immature red cells, and their parent cells, the erythroblasts, are liberated into the bloodstream. From this conception of the disease it would seem that all that need be done is to eliminate the causative poison; but although many sites have been accused of being the primary toxic focus there is little evidence to support them, either experimental or therapeutic.

Splenectomy has been advocated for many reasons. Eppinger noted evidences of diminished hæmolysis after splenectomy for other conditions, and assumed that in pernicious anæmia, a disease of exaggerated hæmolysis, the removal of the spleen would control or counteract this tendency. De Castello suggested the operation because of the good results seen in the allied conditions of hæmolytic jaundice and splenic anæmia. Klemperer recommended it because of the polycythæmia which followed splenectomy for other conditions. It was found that the operation was attended with a high mortality and that it was followed by no material improvement. More recently, owing to work at the Mayo Clinic, a wider view of the treatment has been taken:—

1. An attempt to stimulate the production of new blood by massive step-ladder transfusions of whole blood.

2. An attempt to overcome the absorption of hæmolytic toxins, possibly primary, certainly co-existent, by the removal of septic foci.

3. An attempt to protect the newly-formed and the older red cells by removing the spleen.

In a series of 77 cases there were 8 deaths. Of the remaining 69, 5 had recurrence of symptoms after four months and died at intervals of eight to twelve months; 10 had recurrence after six to eight months and followed about the same course; 48 were in good condition after twelve months. Of these, 12 are alive at the end of two years, 9 at the end of three years, 4 at the end of four years, 5 at the end of five years, and 1 a little over six years. Several cases have been re-transfused on one or more occasions.

The evidence in favour of removal of the spleen is not all one-sided. Bloomfield, at the Johns Hopkins Hospital, divided a series of 57 cases of pernicious

anaemia into two groups; 28 cases were treated by the older method of rest, diet, arsenic, etc., and served as controls to the remainder, who were treated by the more modern methods. His report does not lend weight to the treatment by the elimination of septic foci, transfusion of blood, and splenectomy, and at the Johns Hopkins Hospital splenectomy for pernicious anaemia has been abandoned.

There are many other records of series of cases of this disease, some favouring one, some the other, method of treatment.

To sum up, we may say that no case has been conclusively proved to be cured. There is a small but appreciable mortality. Among the survivors, one-quarter are greatly improved, being able to live normal lives two or three years longer than the average expectation of life. Half the cases are improved to some extent and live a few months or a year or two longer than the average. The remainder do not receive any benefit which is not given by purely medical treatment. If this summary is put to the patient, he can decide for himself whether he will submit to the newer method of treatment.

Leukæmia.—This condition may be considered as a hyperplasia of the various leucocytes—sometimes the lymphocytes, sometimes the myelocytes—scattered throughout the body. The severity of the hyperplasia may be so great that what is called a ‘sarcomoid’ process results. In other cases the blood picture is normal and the newly-formed cells are found massed in the spleen, lymph glands, and bone-marrow. This brings leukæmia into close relationship with lymphosarcoma on the one hand and Hodgkin’s disease on the other. Leukæmia is therefore a disorder in the formation of white cells in the endothelium of the reticulo-endothelial system, and to discover anything bearing on its causation we must look for an agent capable of acting on such a widely distributed system. We must explain why, in some cases, this agent acts outside the blood-vessels and produces a massive deposit without altering the blood picture (Hodgkin’s disease), whereas in other cases the process extends into the vessels and results in the liberation of the newly-formed cells, as we see in a typical case of leukæmia. Pappenheim elaborated the hypothesis that a virus may in the one case travel by the lymphatics, producing a ‘lymphatic leukæmia’, or in the other case by the blood-stream, producing a ‘myeloid leukæmia’.

In 1912 Koranyi, observing the effects of benzol poisoning in the rubber factories and the rapid reduction in the numbers of white cells, suggested the use of benzol in the leukæmias. He also reported that its use was more certain after the spleen had been treated with X rays. The application of radium is even more dramatic in the reduction of the size of the spleen, which in eight or ten weeks may recede from the right iliac fossa to just below the left costal margin. As the spleen gets smaller, the patient rapidly improves and his blood-count approximates more towards the normal. These observations led to the surmise that the spleen itself might have a greater etiological relationship to the disease than had previously been supposed, and to a consideration of the possibilities of splenectomy. The spleen had previously been removed merely because it was enlarged, but the procedure had come to be regarded as a slaughter and not an operation. It was considered that the removal of the spleen reduced in size by the application of radium would be comparatively safe, and this view has been upheld by a series of 26 cases at the Mayo Clinic with 1 death. A report made on the patients afterwards is non-committal; but a still later report shows that 5 patients are in good and 2 in a fair condition after periods beyond the normal expectation of life in this condition.

Hodgkin’s Disease.—The prevailing view of this condition is that it is a disorder of the reticulo-endothelial system, probably infective in origin, in

which there is an intense proliferation of the cells outside the vessels, and no entry of these cells into the circulation. Mellon records a case in which it seems possible that the spleen was the primary focus. There was no evidence of glandular enlargement, but after death the inguinal, bronchial, and retro-peritoneal glands all showed the characteristic changes. The spleen showed a very advanced state of the disease, with areas of anæmic necrosis indicating its long duration. It may seem from this that if the condition had been recognized early and the spleen had been removed, it would have been the only focus; but we are all only too familiar with the case where an apparently solitary focus is removed from the neck only to reappear either there or elsewhere in the course of a few months. There is no case on record where removal of the spleen has either caused a cure or even an amelioration of the disease, and we can best sum up by saying that the operation has no effect, either good or ill, upon its progress.

Splenic Anæmia.—Banti subdivided the progress of this condition into three stages: (1) When there is an enlargement of the spleen with a secondary anæmia; (2) When the liver gradually enlarges and the amount of urine diminishes; and (3) When the liver becomes smaller and ascites appears. His hypothesis as to its causation is that an infective agent causes a primary enlargement of the spleen, which in its turn produces a toxin which acts on the liver and on the splenic veins. The anæmia is the result of the hæmorrhages and the toxæmia combined. It is a little difficult to see why he argues in favour of two toxins when it is possible that the one primary toxin may be made responsible for all the damage. Banti's disease is best regarded as a somewhat vague group of conditions associated with anæmia and enlargement of the spleen. As our knowledge increases, various clinical entities are recognized and allotted a more definite name, and what remains is still Banti's disease.

The most important fact in connection with Banti's disease is that it is cured by removal of the spleen, which argues for a primary splenic condition or assigns to that organ the action of modifying some agent situated elsewhere in the body. It has been supposed to be due to an infection situated in the spleen, to a toxæmia due to the colon bacillus, or to an excessive hæmolysis of the cells by the spleen. The gastric hæmorrhages have been supposed to be due to the rupture of the distended vasa brevia into the stomach as a result of the torsion of the splenic vein caused by the great bulk of the spleen.

There can be no doubt that the only treatment for this condition is splenectomy; even in the late stages where the liver is grossly involved the improvement which takes place is truly remarkable. At the same time every endeavour must be made to operate early, for in the late stages there is an operative mortality of 25 per cent compared with an average of about 10 per cent.

Hæmolytic Jaundice.—There are two types of this disease: a congenital, fully described by Minkowski in 1900, and an acquired, described by Hayem in 1898. The difference between the two types is very definite. The congenital type is mild, and the sufferers have been aptly described as being more jaundiced than ill. The acquired type is much more severe; in it the anæmia rapidly becomes profound, and the crises of pain, temperature, and deepening of the jaundice occur at frequent intervals. Two views have been put forward as to its causation: (*a*) that the red cells are abnormally fragile, and (*b*) that there is an increased hæmolytic activity, probably restricted to the spleen.

Treatment may not always be necessary. In the mild cases the symptoms may be so slight that they do not trouble the patient at all. In the more severe cases medical treatment and radium therapy have proved valueless, whereas splenectomy has proved to be specific. The technical difficulties in the operation are small, and it is attended with a low death-rate. In a series

of 32 cases at the Mayo Clinic there was 1 death. After the operation, the jaundice which has been present for years clears up in about forty-eight hours, and the fragility of the red cells if tested after two or more months is found to be normal.

Gaucher's Disease.—This condition, which occurs in childhood and is most frequently seen in girls, is characterized by a colossal enlargement of the spleen. The enlargement is partly due to the presence of the so-called Gaucher cell, which has been supposed to be a modified reticular cell; hence the name, 'endothelioma of the spleen', which has been applied to it. The liver becomes much enlarged, but the symptoms of cirrhosis are absent. In the later stages the patient may become very emaciated. Removal of the spleen suggests itself; but, on account of the rarity of the disease, figures are difficult to obtain which would show the effect of operation on the condition. Most authorities are agreed that beneficial results are to be expected after removal of the spleen.

Purpura Hæmorrhagica.—In 1887 Denys called attention to the low platelet count in this condition, and in 1890 Hayem showed that, although the blood coagulated, the clot did not contract. There is no abnormality in either the white or the red cells. The bleeding time may be greatly prolonged, sometimes exceeding an hour after a pin-prick, in contrast with the normal of about three minutes. In 1916 Kaznelson observed cases in which the patients had enlargement of the spleen, and, thinking that the low platelet count might be due to a destructive action by the spleen, advocated its removal. It had already been shown that an increase in the erythrocytes and platelets followed the operation of splenectomy, and it was suggested that this operation seemed worthy of trial in purpura hæmorrhagica. It was known that operations for surgical emergencies complicating this condition were not attended with uncontrollable bleeding, and no difficulty of this kind was anticipated in performing the operation.

There are two clinical types of the disease: the more common chronic type when splenectomy is particularly indicated and probably leads to a permanent cure, and the acute rapidly progressing type when the value of the operation is open to question. There is no definite knowledge as to the cause of the low platelet count, but it has been suggested (a) that there is a primary disease in the bone-marrow leading to a diminished formation of platelets; (b) that toxins in the circulation destroy the platelets which are present in normal numbers; and (c) that it is a primary destruction of the platelets by a spleen which has been shown to be enlarged in some cases. None of these theories is entirely satisfactory, the only definite fact which we know is that when the spleen is removed the condition is cured. Beer reports a series of 5 cases: 4 done for the chronic condition with no deaths, and in every case complete restoration of health; and 1 done for the acute type, which ended fatally.

Abscess of the Spleen.—In general infections the spleen is frequently enlarged and congested, and an abscess may develop. It may also occur in pyæmia, or as a result of the infection of a hæmatoma. Chronic abscess is seen in actinomycosis, tuberculosis, or hydatid disease, or may result from the breaking down of an infarct or a gumma. Adhesions readily form and the abscess may rupture into the general peritoneal cavity or one of the abdominal viscera, or may track into the abdominal parietes. Although splenectomy has been performed for the condition on several occasions, in most cases it is not justifiable on account of the danger in separating the extremely dense adhesions which may be present or of infecting the general abdominal cavity. In most cases the abscess can be dealt with quite readily by drainage under the last rib.

Hydatid Cyst.—This is a very rare condition in the spleen. When it occurs it may attain an enormous size, may calcify and give rise to few symptoms,

or may become secondarily infected and give rise to an abscess. In cases where the spleen is not fixed, splenectomy is advisable; but in the case of a very much enlarged spleen, or one bound down by adhesions, marsupialization is to be recommended.

Sarcoma of the Spleen.—Very occasionally a primary sarcoma is found in the spleen. It forms a hard irregular tumour, accompanied by pain if the peritoneal coat is involved. It is said to be associated with a polycythaemia, which is to be clearly distinguished from Vaquez's disease. Secondary deposits are formed early; but if a case is taken early and the spleen removed, the results are favourable. Council in 1912 collected 16 cases, 7 of which were reported to be in good health after varying periods, the longest being $6\frac{1}{2}$ years.

Syphilis of the Spleen.—Gummata are sometimes met with in the spleen, and the diagnosis is not always easy to make. They frequently do not react to antisypilitic treatment, and the Wassermann reaction may be negative. The spleen has been excised for this condition on several occasions. A much more interesting connection between syphilis and the spleen has been pointed out. A certain percentage of cases of syphilis have a positive Wassermann reaction which remains positive in spite of treatment. Mayo pointed out that the spleen might be the fastness in which the spirochætes could lodge and defy all specific drug treatment, and showed that splenectomy would permit a rapid cure by medical means.

Ascites.—The ascites which occurs in connection with cirrhosis of the liver is purely mechanical. The contracted liver is not capable of letting through the amount of blood which is presented to it in a given time, and as a result the pressure in the portal system rises, and fluid is exuded and appears clinically as ascites. It is reasonable to suppose that, if the amount of portal blood were decreased, the liver could let it all through and ascites would not occur. It has been suggested that this end could be attained by splenectomy, thus cutting out the blood which normally enters the portal vein from the splenic vein.

Carcinoma of the Pancreas.—Although it has not been possible to excise the pancreas in cases of malignant disease, the details of such an operation have been worked out. Among other things the spleen has to be removed, as the splenic artery and vein, which we should expect to find embedded in the growth, must be sacrificed.

This list of the affections for which the spleen has been removed is certainly very formidable; but if each disease is taken and its pathology analysed it will be seen that in every case splenectomy justified itself, either in this way or by its results. A rapid glance might make it appear that the list is identical with the causes of enlargement of the spleen, which brings us to the last point, namely, that enlargement of the spleen is not an indication for splenectomy.

SPLENOMEGALY, PRIMARY. (*See GAUCHER'S DISEASE.*)

SPRAINS AND TRAUMATIC SYNOVITIS. *E. W. Hey Groves, M.S., F.R.C.S.*

SPRAINS.

A true sprain is an injury of a joint which involves some actual tearing of the ligaments. In minor cases, only a few fibres of the ligament are torn, whereas in cases of greater severity one or more ligaments are either torn across, or more frequently one of the bony attachments is avulsed. In the latter case the sprain is in reality the first stage of a fracture dislocation, and there is often some degree of displacement of the joint surfaces; or, if the nature of the injury is not recognized or not efficiently treated, an unstable and weak joint

may be the ultimate result. A sprain is an injury the full extent of which it is easy to overlook in the early history of the case, and the result of this oversight may be disastrous for the function of the limb, or incidentally for the reputation of the medical attendant. If we allow the minor degree of fracture, i.e., those cases in which a ligament has torn away a piece of bone, to be included in the term, then it is convenient to divide sprains into three classes: (1) *Minor sprains*—no complete rupture of ligament; (2) *Serious sprains*—one or more ligaments are torn across; (3) *Fracture sprains*—a ligament has torn off its bony attachment and dislocation has occurred, or this may be caused by injudicious treatment. The routine treatment of all sprains—and this applies chiefly to the elbow, wrist, thumb, knee, and ankle—should be in the first place, if possible immediately after the accident, to employ firm and even pressure by means of a well-applied bandage. This may be done over a layer of wool, or over a sock. The limb is then suspended or elevated so as to minimize the amount of effusion, and the injured part should be X-rayed without further delay. It is unwise to delay in applying the bandage even for an hour in order to get the X rays, because the whole secret of securing the rapid recovery of a minor sprain is to prevent effusion. It is, however, equally unwise to assume that any case is only one of the minor variety and to neglect the X rays, because there may be a fissure of the bone or a torn-off bony point, the presence of which will greatly modify both treatment and prognosis.

The Treatment of a Minor Sprain.¹—These injuries are common in the case of athletes, and an early return to sports is the great desire of the patient's mind. Such a natural desire can only be gratified by a due observance of the methods of treatment applied in proper sequence. The injury consists in the tearing of some of the fibres of one of the joint ligaments, and this is followed quickly by the effusion of blood into the tissues outside the joint and of synovial fluid into its cavity. The first essential, then, is to prevent or limit this effusion by pressure applied as soon after the accident as possible. A roller bandage over wool is the best means of carrying out this treatment, and the bandage should be applied as tightly as can be borne. In some joints—e.g., those of the thumb or fingers—it may be better to use narrow strips of adhesive plaster, but a bandage is more convenient for the knee or ankle. The application of ice-cold water to the part before putting on the bandage has a soothing effect, and it is also good because it contracts the vessels and so helps to limit the effusion. Hot-water applications, on the other hand, may allay the pain, but they are harmful in the early stages because they dilate the blood-vessels. After twenty-four hours the bandage should be removed, and light stroking massage applied whilst the patient makes gentle active movements such as he can do without causing pain. The bandage is then reapplied. This treatment of bandaging, massage, and movement is continued daily, and then, about the third or fourth day, the patient is allowed to begin movements with some weight-bearing. It is, of course, essential that no extreme movement or lateral strain should be allowed, such as will put the torn ligament on the stretch. After the third or fourth day, radiant heat and deeper massage should be added to the treatment so as to encourage the absorption of peri-articular effusion. If taken early and treated efficiently, a case of minor sprain should have recovered by the end of about ten days. In cases, however, which have been neglected, and also in patients who are nervous and who will not take active movements, there is often some continuing disability, pain, weakness, and stiffness. Such cases have some peri-articular adhesions which should be broken down under an anæsthetic, and if the medical attendant does not do this he may have the mortification of hearing that his patient has been miraculously cured by a bone-setter.

The Course and Treatment of Severe Sprains.—In the early stages of the case, the method of examination and treatment is the same as for a simple sprain, and the full nature of the injury may not be revealed for some time. There are three circumstances which may occur to indicate that there has been complete rupture of a ligament or avulsion of a bony point. Blood effusion as shown by widely spreading ecchymosis, may be observed two or three days after the accident, and is particularly great when a superficial point of bone—e.g., the tip of one of the malleoli—has been broken off; but this sign may be absent when the ligament or its bony attachment lies inside the cavity of the joint, e.g., rupture of the anterior crucial ligament with avulsion of the tibial spine. Skiagrams show the tearing off of a piece of bone corresponding to the attachment of a ligament; or possibly there is merely a roughening of the bone from which the ligament has been torn; but in either case such an appearance proves that the sprain is one of major severity. The third sign of important structural injury to the joint is the existence of partial or possible dislocation. If subluxation already exists, it is manifested by an altered contour of the joint, by marked impairment of movement, and by the X-ray appearances. The possibility of partial dislocation is shown by the fact that abnormal movements of the joint can be brought about by manipulation. In the knee, for example, rupture of the internal lateral ligament is indicated by the joint allowing lateral abduction, whilst rupture of the anterior or posterior crucial ligament is indicated by the fact that the head of the tibia can be slid forward or backward over the end of the femur. This abnormal mobility of the joint is often not noticed until weeks after the injury at a period when, if the sprain had only been of a minor variety, full function would have been restored. It is of great importance to recognize the severe type of sprain early in the history of the case, because then, by due precaution, complete functional recovery can be assured. If, on the other hand, the patient is allowed to make unrestricted movements at the end of ten days, the torn ligament will probably fail to unite or will do so as a slack and lengthened cord, whilst the joint remains permanently weak. As this important point of the early recognition of a torn ligament applies chiefly to the knee and ankle, it may be well to consider each of these joints individually.

In the knee there are three sets of ligaments which may be ruptured in a bad sprain, viz., the lateral ligaments, the semi-lunar cartilages, or the crucial ligaments, though it is fortunately rare for more than one of these paired structures to be involved at the same time. It is the internal lateral ligament, the internal semi-lunar cartilage, and the anterior crucial ligament which are most liable to rupture. The lesion of the lateral ligament is indicated by great pain on abduction of the leg at the knee in the early stages, and later on by abnormal lateral mobility and weakness with a development of genu valgum. The tearing of the semi-lunar cartilage is indicated by a locking of the joint which is relieved by forcible manipulation, or, if not thus relieved, leaves the joint slightly flexed, whilst forcible extension is very painful. The rupture of the anterior crucial ligament is indicated by the fact that when the limb is relaxed the head of the tibia can be displaced forwards on the femur by manipulation.

In the event of either of these typical lesions of the ligaments being recognized within one or two weeks of the accident, the principles of treatment are the same. The early stages of treatment by firm bandaging, massage, and gentle restricted movement having been followed during the first week, it will then be necessary to fix the knee-joint by a rigid splint, e.g., a bivalve plaster case or a caliper splint which will not allow any movement in the interval between the daily treatments. After three or four weeks a hinged caliper

splint should be worn which will restrict movement to simple flexion and extension whilst preventing abduction, rotation, or forward movement of the tibia upon the femur. This splint must be worn for about three months. If the lesion be one of the internal semilunar cartilage, it is, of course, essential that complete reduction of the displaced cartilage must have been effected before the splinting takes place. If the knee-joint cannot be fully extended, and if an attempt to do this causes pain, it is a sure sign that a torn cartilage is interposed between the articular surfaces, and this must be removed by open operation.

Severe sprains of the ankle are much less complicated in their nature than those of the knee. They nearly always involve rupture of part of the internal lateral ligament of the joint. This is indicated at an early stage by marked ecchymosis or by great pain on the inner side of the joint when any weight-bearing is attempted. At a later stage it is manifested by the development of a painful and intractable valgoid deformity. The treatment of the condition consists in putting up the foot in forced inversion and adduction so as to bring the torn ends of the internal lateral ligament into close apposition. This position is most securely maintained by a plaster cast which is cut into two halves so that it can be removed for daily massage of the joint. After three or four weeks the plaster is left off, and the patient is provided with a shoe tilted outwards by a $\frac{3}{8}$ -in. thickening of the inner margins of the sole and heel. Such a tilted shoe should be worn for from four to six weeks.

Sprains Associated with Minor Fractures.—Although at first sight this type of joint injury might be thought to be more serious than that in which only a ligament is torn, yet in actual practice it is not so, for the reason that with the ordinary precaution of routine X-ray examination it is easily recognized and due precautions are taken, whereas the torn ligament is frequently overlooked. There are two types of fracture which may be associated with a severe sprain. In one there is merely a fissure or crack running through the articular end of the bone without any breach of continuity. This does not require any special treatment, but it should modify prognosis as to the time taken for recovery. For example, the head of the radius may be cracked in an injury to the elbow-joint, and this will cause both pain and weakness in the arm which may last for some months. The other type of fracture associated with sprain is the tearing off of a bony point at the margin of the joint, either by a ligament or a tendon. In the shoulder-joint, the tip of the coracoid process or the lower margin of the glenoid cavity may be separated; in the elbow, the coronoid process of the ulna, either of the epicondyles, or a piece from the margin of the head of the radius; in the wrist, the styloid process of the ulna or less commonly of the radius; in the knee, one of the tubercles of the tibial spine or a part of the condyle giving attachment to the lateral ligaments; in the ankle, the top of either the external or internal malleolus. It is beyond the scope of the present article to discuss the treatment of these different types of fracture-sprain in detail, and only general principles can be dealt with. Generally speaking, if the broken-off piece of bone is small, and if there is not much separation, the treatment will be on the same lines as that used for severe sprains with only rupture of the ligaments—that is to say, early bandaging and massage, then splinting for a few weeks in a position which keeps the bony fragment in good apposition, and, lastly, the wearing of an appliance, e.g., a caliper splint or a tilted shoe, which will allow movements of the joint without strain on the broken fragment. If, however, the broken fragment is large and superficial, the treatment may often be shortened and made more efficient by an open operation by which the separated fragment is nailed securely in its place to the main bone. Such an operation will be

most useful for one of the epicondyles of the humerus or for the broken-off tip of the internal malleolus.

F. J. Hathaway² has also made the valuable suggestion that the avulsed styloid process of the ulna, which is so often broken off in Colles's fracture, may be pinned in place with great advantage.

TRAUMATIC SYNOVITIS.³

This term is applied to any condition of synovial distention which follows and is caused by a recent injury. In the early acute stage of any severe sprain the joint cavity may become filled with blood, which is very slowly absorbed and its place taken by synovial fluid in considerable excess of the normal amount. But it is in the later stages of the condition, weeks and months after the injury, that chronic synovitis following an injury causes the greatest anxiety, both as regards treatment and prognosis. The point for first consideration is to determine, if possible, the reason why the effusion has persisted. Such a reason may be found in one of the following five conditions: torn ligament, fractured bone, hypertrophied synovial fringes, injured muscle, or secondary infection. The first two of these conditions—a torn ligament and a fracture—have already been dealt with under the heading of 'Severe Sprains'. Rupture of the internal lateral or anterior crucial ligament or avulsion of the tibial spine are conditions which commonly lead to persisting synovial distention of the knee-joint. If such a lesion is proved to exist, the choice of treatment will lie between some retentive apparatus, e.g., a hinged caliper splint, and an open reconstructive operation. Probably it will be wise to try the appliance in the first place, and then, if a reconstructive operation has to be performed, the same appliance will serve for the after-treatment.

The exact association between muscle injury and chronic synovitis is difficult to define, but it is quite certain that it is a close one. Just as rapid wasting of the muscles of a joint follows infection of the synovial cavity, so, inversely, injury and atrophy of a muscle controlling the joint is often accompanied by chronic synovial effusion. This is notably the case in the atrophy of the vastus internus muscle associated with persistent synovial effusion after knee injuries. In such a case, patient massage and exercises should be combined with a firm bandage over the knee. If the bandage is not sufficient, then a soft leather case should be fitted to the limb, extending four to six inches above and below the knee and made to lace on with any degree of tension.

If neither ligament, bone, nor muscle lesion be found to account for the chronic synovitis one has to decide whether it is a condition of traumatic hypertrophy of the synovial fringes or one of early secondary infection. It must be admitted that it is not at all clear whether hypertrophy of the synovial membrane with the formation of tags and fringes which get caught in the joint is ever the result of simple trauma, or whether there is not always an infective element in such conditions. We know so little of the true infective nature of rheumatoid arthritis or osteo-arthritis that we cannot prove their existence in any early case of single joint lesion. We must therefore proceed with treatment on somewhat empirical lines, duly warning the patient of the possible supervention of a chronic arthritis.

In the case of *elderly or infirm patients*, chronic synovial effusion which has persisted in spite of massage and bandaging should be treated by various counter-irritants, e.g., Iodine, Mercury Ointment, or Scott's Dressing. In *younger patients* it is better to open the joint to determine whether there is any loose or torn cartilage, to wash out all the synovial fluid, and to clip away all obviously inflamed and redundant synovial fringes. If the synovial

hypertrophy presents a pale gelatinous appearance, a portion of this tissue should be sent to the pathologist for culture and inoculation tests as to the possibility of tuberculosis.

REFERENCES.—¹Light, *Therap. Gazette*, 1926, Dec., 844; ²*Brit. Med. Jour.* 1926, ii, 58; ³W. H. Trethowan, *Guy's Hosp. Rep.* 1926, Oct., 433.

SPRUE.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

ETIOLOGY.—An important report on researches on sprue during 1924-25 in Bombay has been published by N. H. Fairley and F. P. Mackie and others.¹ They first deal with the disputed question of the etiological action of yeasts, which they divide into: (A) The *Monilia ashfordi* type, which Ashford has for long maintained is the cause of the disease; (B) *Monilia* of a similar type, but differing in some important particular, such as acid production in maltose without gas, or absence of the pine growth in gelatin; and (K) The typical *kruzei* group not fermenting glucose. As the result of their study of 137 strains from 111 cases of sprue and other diseases, they conclude that this organism has no primary etiological relationship to sprue, and at the most it may be responsible for some of the intestinal fermentation through being a secondary infection. This view is in accordance with the opinions of most British workers. Discussing the pathology of sprue, they regard the disease as due to some unknown infective agency primarily involving the mucosa of the alimentary tract, sometimes producing congestion or ulceration of the small bowel, and leading to generation and absorption of toxic substances, which deleteriously affect the blood elements, bone-marrow, and parenchymal cells of the internal organs. They have also carried out observations on fractional test meals, and found that sprue differs from pernicious anæmia in that no true achylia exists, and in sprue the HCl is secreted efficiently, but is neutralized by alkaline secretions of the duodenum. Anæmia is an important symptom in sprue, and it resembles the pernicious type except that normoblasts and myelocytes are rarely met with; they also found that van den Bergh tests for estimating the bilirubin in the serum give high indirect reactions in pernicious anæmia as a rule, but low ones in sprue; but they failed to obtain any definite evidence of the value of parathyroid and calcium lactate in its treatment, as compared with adequate dietetic measures, which they hold remain the fundamental basis of all successful therapy. E. A. Baumgartner and G. D. Smith,² working in New York, report culturing *M. ashfordi* from the stools of 10 out of 11 sprue cases at one time or another, but they found the same organism in rather large percentages of pernicious anæmia cases and also in various diarrhoeal conditions.

H. B. Newham, R. M. Morris, and P. H. Manson-Bahr³ report a study of the anæmia of sprue and its comparison with pernicious anæmia, and they find that, although they have several features in common, they are distinct etiologically, and differ in sprue being a disease of the tropics, and being much less fatal than pernicious anæmia, and that it is secondary to gastro-intestinal lesions, with deficient assimilation of food, and not due to disease of the blood-forming organs. Further, in sprue there is much wasting, as contrasted with good nourishment in pernicious anæmia, and the toxins of sprue have not the selective action on the nervous system of those of pernicious anæmia.

TREATMENT.—C. A. Shepard and W. D. Fleming⁴ report four cases of sprue treated by Calcium Lactate and Parathyroid Extract, together with dietetic measures, with recovery in three, but they think the Diet is at least as important as the medicinal measures, milk forming the sole food at first, and excess of sugar, starch, and fat being avoided later.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1926, July, 105; ²*Amer. Jour. Trop. Med.* 1926, Nov., 433; ³*Lancet*, 1926, ii, 269; ⁴*Amer. Jour. Trop. Med.* 1926, Nov., 443.

STAPHYLOCOCCUS INFECTIONS. (*See also* Erysipelas; Skin, Staphylococcal Infections of.) J. D. Rolleston, M.D.

F. A. Stevens¹ reports three cases of *Staphylococcus aureus* infection with a scarlatiniform rash which closely resembled that occurring in infections with *Streptococcus scarlatinæ*. The cases were distinguished by the absence of *Str. scarlatinæ*, the presence of *Sta. aureus*, a positive blanching phenomenon with staphylococcus antitoxin, and no blanching with *Str. scarlatinæ* antitoxin.

REFERENCE.—*Jour. Amer. Med. Assoc.* 1927, lxxxviii, 1957.

STERILITY.

Beckwith Whitehouse, M.S., F.R.C.S.

With a progressively falling birth-rate, and the evident desire of many individuals to shirk the responsibilities of parenthood, the question of sterility is to-day of considerable importance. Sterility is a fairly common condition, and it is possible that deliberate anti-conceptual measures indirectly as well as directly tend to produce a permanent afertile state if practised for any length of time. In the case of certain animals when pregnancy is experimentally prevented, as for example by coitus with a vasectomized male, the ovaries subsequently show many follicular cysts and hæmatomata resulting from abnormal or non-dehiscence of the Graafian follicles. Similar lesions have been found in the ovaries of sterile women, and therefore the possibility of producing permanent sterility should be explained to young married individuals, many of whom practise temporary contraception with the view, not of abolishing, but of postponing, the problems attached to parenthood. This matter, which has so far received little attention in the literature relating to conception and contraception, is a subject which is well deserving of further experimental investigation.

Defective ovarian physiological function as a cause of sterility is a point which has aroused interest. This is partly a result of recent work on menstruation and the ovarian hormones, and partly because so many patients who seek advice on account of sterility present little or nothing in the way of abnormal physical signs. Even when ovaries to all intents and purposes appear to be normal, and are certainly not the seat of inflammatory or developmental lesions, it is possible that physiological function may be defective. In other words, these organs produce sex-cells of low vitality. This is undoubtedly the case in some animals, and there is no reason to think that the human species is different in this respect. Professor Arthur Robinson, working with ferrets, has found that of the ova which escape from the ovary after insemination about 40 per cent perish either before or shortly after fertilization. In the case of mares a wastage of about 50 per cent occurs. This loss of potential genetic cells is important from the point of view under consideration. No reason can be assigned for the death of the egg-cells, but if the percentage of natural wastage is high, a relative state of sterility is produced. In the words of Robinson, these cells die "when they are still ova, either because they are lost in the peritoneal cavity, or because they fail to unite with spermatozoa, although spermatozoa are present. They die after they have become zygotes, both in the morula stage and in the blastula stage, before they have become attached to the decidua. They die also after the blastula has become attached to the decidua and after the zygote has differentiated into embryo and appendages; thus the questions of 'when' and 'where' are answered".

Little is as yet known with regard to the factors which influence the vitality of the reproductive cells. Experiment in the case of animals has shown the importance of vitamin E, the withholding of which from the diet tends to produce death of the fertilized ovum. This vitamin is present in certain foods in considerable quantity, notably in wheat, peas, and lettuce. Apart, however,

from any specific 'reproductive vitamin', fertility is closely associated with the general metabolic activity of the individual. It has long been known that increasing obesity tends to promote sterility. More recently it has been found that fertility is diminished when the basal metabolic rate is consistently low, as in the hypothyroid state and some other conditions.

It is necessary to remember that metabolic deficiency, the influence of age, and certain toxic states—e.g., chronic alcoholism, cinchonism—are liable to, and probably do, affect the vitality and activities of the spermatozoon just as they do the unfertilized ovum. Many men over 60, although virile, are sterile, and only produce sex-cells of poor stamina. Victor Bonney¹ recently drew a good pen picture of male sterility in the following words: "If I had to make a mental composite picture of the type of man most commonly responsible for sterility by male default, I would draw a well-set-up man round about 50, looking just a little old for his age, but of attractive personality—perhaps an Army officer, or one that has spent many years in the East, where, likely enough, he has had malaria; a good sportsman, a good shot, a good rider, who has combined strenuous work in his calling with strenuous pleasure of all kinds".

The percentage of cases in which the male is at fault is variously estimated at from 10 to 25 per cent of all cases of sterility. This figure, whilst perhaps not excessively high, is sufficient to show the importance of investigating this avenue when the problem of sterility is presented. The common mode of procedure is to obtain a specimen of semen from a condom and to examine the same on a warm stage for motility of the spermatozoa. This method has recently been criticized, however, on the ground that, although active male elements may be present in a condom, experience has shown that they are not infrequently destroyed by the secretions present in the vagina and the cervix. Hühner² has found that conception is most unlikely to occur unless the cervix is directly inseminated, since spermatozoa quickly perish in the acid environment of the vagina. In the healthy cervical canal and uterine cavity spermatozoa live much longer. The Hühner test, therefore, consists in aspirating the mucus from the cervical canal within a few hours after coitus, and investigating the secretion for the presence of living sperms.

Post-coital examination, and its therapeutic corollary artificial insemination, have not found much favour in this country. There is no doubt that from a purely scientific point of view the Hühner test has much to recommend it; but practical difficulties, and perhaps a certain amount of delicacy, have so far militated against its more general adoption. Hühner's investigations have, however, drawn attention to the important part played by the cervix and the cervical secretion in conception, and have emphasized the necessity for correcting any lesions, e.g., cervical erosion, cervical lacerations, or chronic cervicitis, which materially affect its function. Also, if direct insemination of the cervical canal is as important as has been stated, then such items as the relations of the cervix to the posterior vaginal fornix, and the completion of the female orgasm, must be accorded fresh significance in the investigation of the cause of sterility.

When vigorous ova and spermatozoa are produced by the respective glands and the sexual act is normally performed, it would appear that the most common cause of sterility is some anatomical defect produced by pathological lesions in the upper genital tract. This observation receives support from the recent figures published by Robert L. Dickinson and William Cary.³ These writers found in a sequence of 300 sterile unions that salpingitis occupied the premier place as the most common major defect (39 per cent). Gonorrhœa appeared to be the infecting agent in slightly less than one-half of the cases.

In the light of these facts the recognition of the presence and site of inflammatory lesions in the Fallopian tubes producing obstruction from kinks, adhesions, or closure of the abdominal or uterine ostia is of the utmost importance.

Cary,⁴ of Brooklyn, in 1913, first showed that it was possible to demonstrate the patency of the tubes by means of the vaginal route. He used in the first place collargol and more recently a solution of sodium iodide (15 per cent) to produce a shadow which on a radiograph not only indicates the presence but also the site of any obstruction. Various other chemical agents have since been employed by other observers, one of the most widely used at the present time being 'lipiodol' as advocated by Forrestier. In 1919 Rubin found that the patency of the Fallopian tubes could be more easily ascertained by inflation of the upper genital tract with oxygen or carbon dioxide. Also, quite apart from its diagnostic significance, insufflation appears in some cases actually to aid the sterile patient. How this is effected is not clear. It has been suggested that it accomplishes its object either by separating small adhesions between the folds of the tubal mucosa or by actually straightening out tortuous tubes.

Rubin's instrument is rather an elaborate mechanism, and involves the constant use of gas cylinders containing oxygen or carbon dioxide. Bonney's apparatus is much simpler, and although perhaps not so scientifically accurate, appears to attain the same practical end. It consists of a hollow uterine 'sound' or dilator to which is attached a length of rubber tubing fixed by means of a T-piece to a bulb and a simple 'dial' manometer. The apparatus is used by introducing the hollow dilator into the uterine cavity after dilatation of the cervical canal. The vagina is filled with an antiseptic solution, and the bulb is compressed. If the Fallopian tubes are patent, inflation can be accomplished without the manometer rising above 100 mm. of mercury. The pressure may be raised to 200 mm. without risk of injury, but above this figure there is a possibility of tubal or cornual rupture.

In America, tubal inflation is practised in the consulting-room or 'office' as a diagnostic procedure. This has not found favour in Great Britain, and the method is only employed in the operating theatre as a preliminary to laparotomy should the apparatus show that tubal occlusion is present. Bonney, in fact, recommends that the intra-uterine cannula should actually be left *in situ* during the laparotomy in order to demonstrate the site of closure and to prove when the obstruction has been overcome.

Restoration of the lumen of a previously closed Fallopian tube from tubal to uterine ostium is a branch of plastic gynaecological surgery which has received a fresh impetus from the perfection of diagnosis rendered possible by the inflation or X-ray technique. Simple salpingostomy, or opening up of the abdominal ostium, has not been followed by the success which at first sight appeared possible. It is certainly the simplest and therefore easiest of tubal lesions to remedy. Unfortunately the same pathological cause which produces adhesions about the distal extremity of a tube not infrequently closes the uterine ostium also. When such is the case, no cure of sterility is possible without tubal grafting. Reimplantation of the tube into the uterus involves a technique which requires considerable skill. The method is as yet too recent to express any considered opinion on the result or value of the operation. The most that can be said is that the treatment is built on a sound scientific basis and in capable and experienced hands may attain some measure of success. How much remains yet to be proved. There is no accounting for the vagaries of nature when considering the possibility of the cure of sterility. The writer has personally seen two patients in whom pregnancy supervened after apparent

complete excision of both Fallopian tubes for double hydrosalpinx. On the other hand, to quote a recent utterance of J. O. Polak,⁵ "there are many unsolved problems in this interesting subject, and with all we have learned, most of our cures are by accident or are incidental, for there are psychical or biochemical factors in the consummation of the marriage act which can and do prevent conception in the anatomically perfect".

REFERENCES.—¹*Clinical Jour.* 1926, IV, No. 40. ²*Sterility in the Male and Female*, Rebman, 1913; ³*Jour. Amer. Med. Assoc.* 1927, LXXXVIII, No. 1; ⁴*Amer. Jour. Obst.* 1914, LIX, 452; ⁵*Surg. Gynecol. and Obst.* 1927, April, 520.

STILL-BIRTHS REGISTRATION. *Joseph Priestley, B.A., M.D., D.P.H.*

The Births and Deaths Registration Act 1926 came into force on July 1, 1927, requiring *inter alia* the registration of still-births by the Registrars of Births and Deaths. The definition of 'still-birth' laid down in the Act (s. 12) is as follows:—

'Still-born' and 'still-birth' shall apply to any child which has issued forth from its mother after the twenty-eighth week of pregnancy and which did not, at any time after being completely expelled from its mother, breathe or show any other signs of life.

This is an important requirement, which must be strictly carried out by all medical practitioners or other persons concerned. If a child lives only for a minute or so, as shown by breathing or other signs of life after birth (and complete expulsion from its mother), both the birth and the death must be registered, and the former (the birth) also notified, as a live-born child, and, consequently, not a still-birth. Burial in a burial ground will be refused until such registration certificate of 'still-birth' has been obtained from the local registrar and delivered to the Burial Authority, and the registrar will require that, before issuing his certificate, a written certificate be furnished signed by a registered medical practitioner or certified midwife who was in attendance at the birth or who has examined the body of the child, or failing that, a declaration by the relatives in the prescribed form. In the last-mentioned case, the Medical Officer of Health will be expected to investigate. It will be noted that, by a curious error of omission in drafting, no provision is made for a child in the process of being born, i.e., before the whole body of the child is brought alive into the world.

The new Act is a very important innovation, when it is borne in mind that hitherto the routine custom, and therefore presumably the admitted legalized procedure, at lying-in hospitals (and elsewhere) has been to dispose of the bodies of so-called still-born infants by cremation on the premises! The extraordinary thing is that such a crude procedure should have been allowed. However, better late than never! The Ministry of Health (and medico-legal authorities) have now come to the conclusion that such an unsatisfactory method—such a slipshod arrangement—must cease, and the necessary official Order has consequently been issued by the Ministry of Health, making the previous procedure illegal, and stating that the course to be adopted in relation to still-born bodies in the future must be the same in hospitals as elsewhere, viz., official certification (the certificates to be sent to the local authorities), with the consequent and subsequent usual procedure of administration. This is a radical change that cannot be too much emphasized, or too much advertised, for the direction as well as for the information of medical practitioners, who will be called upon, again and again, to give advice in such cases. The object of the tightening-up of the administrative reins is obvious, and the statistics that will accumulate should prove of value and lead to future satisfactory results.

STOMACH, CANCER OF (MEDICAL). *Robert Hutchison, M.D., F.R.C.P.*

G. B. Eusterman and Winfred H. Bueermann¹ review the present position as regards the diagnosis and prognosis of gastric carcinoma in the light of the experience of the Mayo Clinic. They have little new to say, but the following summary of their article is worth quoting: The traditional conception of gastric carcinoma is in need of revision in the light of present knowledge. Progress in our knowledge of the disease has come through clinical and histopathological study of ulcers coming to operation which proved to be carcinomatous, rather than from a study of the primary type in the advanced stage. The causes of delay in the earlier diagnosis and treatment are due to several factors: procrastination, incomplete examination, failure on the part of the laity as well as of the physician to realize the gravity of dyspepsia having its onset in middle or late adult life, obsolete teaching and text-books. There may be few symptoms or signs in certain cases, or the lesion may be well advanced before tangible symptoms occur. The symptoms are largely dependent on the site, extent, and degree of motor impairment. Diagnostic teamwork makes earlier diagnosis and better prognosis possible. One patient in four has an operable lesion. Carcinomatous ulcer, usually simulating benign ulcer, is more common than is generally supposed. Every gastric ulcer is potentially a carcinoma. Eight per cent of carcinomatous ulcers occur in patients under 40 years of age. Achlorhydria is present in 4.5 per cent of chronic benign gastric ulcers in patients past middle life. The necessity for diagnostic observations and laboratory examinations, or exploratory operations, is in inverse ratio to the skill of the röntgenologist. Röntgenological criteria of inoperability are more accurate than those of operability. Intrinsic gastric lesions that simulate carcinoma are gastric syphilis, lymphosarcoma, and benign tumour. Extrinsic lesions are carcinoma of the pancreas, carcinoma of the duodenum, and advanced disease of the gall-bladder, or carcinoma of that organ. Of various constitutional diseases that may have symptoms like those of carcinoma, pernicious anaemia is the most important. Important advances have been made in the pre-operative preparation of patients and in anaesthesia. Exclusive of direct extension of metastasis to other organs or tissues, the most unfavourable index to prognosis in general is perigastric lymphatic involvement: 52.5 per cent of patients without lymphatic involvement were well and free from recurrence three years after operation: in the group with lymphatic involvement the percentage was reduced to 18.

TREATMENT.

T. Izod Bennett² summarizes the treatment as follows:—

Curative Measures.—Attempts at curative treatment fall under three heads: surgical, medical, radiological, two of these being frequently combined.

SURGICAL.—Excision of the primary growth still presents the greatest hope of cure. It should be attempted whenever possible. In this connection it must be remembered that pyloric growths producing gross gastric retention, with dilatation of the stomach and profuse vomiting, are not infrequently small in size and relatively easy to remove surgically.

MEDICAL.—Curative medical treatment usually takes the form of intravenous injection of salts of the heavy metals, such as copper, lead, and selenium. Great caution is necessary, and the results so far have been interesting rather than encouraging. Attempts to cure cancer of the stomach by special diets have been uniformly unsuccessful. The Wassermann reaction should be determined in every suspected case, benign gummata having occasionally been mistaken for malignant growths.

RADIOLOGICAL.—Deep X-ray therapy may be tried, but should never be

substituted for surgery in operable cases. Amelioration of symptoms may follow its employment, but never cure. The implantation of radium or radon by a minor surgical operation is often a preferable form of radiological treatment; the growing edge of the carcinoma can in this way be attacked, and localization of treatment is easier.

Palliative Measures.—The treatment of symptoms and complications again falls under the heading of surgical, medical, and radiological.

SURGICAL.—The commonest use of surgery in cancer of the stomach is for the prevention of obstruction. Remembering that pyloric obstruction is a frequent cause of death in these cases, the practitioner will be at pains to secure a short-circuiting of pyloric growths at a stage when such a procedure is practicable. The selection of such a site for the stoma that subsequent blockage does not occur is a matter of surgical technique. Surgical operations for the prevention of pain by nerve-section are infrequently required.

MEDICAL.—Here two main aspects of the disease overshadow all others; they are: (1) Obstruction; and (2) Pain.

1. *Obstruction.*—The necessity for the surgical prevention of obstruction has already been emphasized. Cases are met with fairly often in which the extent of the disease or the patient's low condition precludes such operations. Obstruction of the cardiac orifice is not here considered; its treatment does not materially differ from that of œsophageal obstruction.

In inoperable pyloric obstruction the treatment of greatest value and most frequently neglected is **Gastric Lavage**. It cannot be over-emphasized that this is a procedure which patients, with very little practice, can themselves perform with ease and considerable advantage. A soft rubber tube, of about the calibre of the little finger, and if possible furnished with a single large opening half an inch above the tip, should be selected. The patient should be taught to pass this at first daily, later as often as required, and the stomach should be washed with normal saline until relatively clean and empty. Sodium bicarbonate solution is useful if there is any excess of mucus, and opiates may be added later by this route if there is an indication for them. Gastric lavage should never be delayed until the time when it is an increased burden to the patient; he should, on the contrary, learn its value in the early days, just as a patient in the early days of an attack of pneumonia will learn to appreciate the value of oxygen and call for it gladly, even in the delirium preceding the crisis.

Diet is of great importance. Patients with carcinoma are seldom hungry, and there is no evidence that forced nutrition has any effect in delaying the progress of their malady. If therefore hunger is allayed there is no reason for attempting to provide a large diet. The problem of obstruction remains the most prominent. Foods containing cellulose, such as green vegetables, brown or branny breads, fruits other than orange-juice and soft bananas, should be excluded, together with meat or fish in large pieces, unless obstruction in any degree be absent. Soups, carbohydrate gruels, milk, glucose solutions, and orange-juice are the foods of choice when obstruction is threatened, and **Alcohol** is a most valuable adjunct in these cases on account of its calorie value, sedative effects, and ready assimilation.

There is nothing illogical in the combined use of such foods with gastric lavage; a partially obstructed stomach frequently relieved by lavage will allow the progress of more fluid than such a stomach treated in any other way. In inoperable cases of severe pyloric obstruction, nutrient enemata must be employed to relieve thirst.

2. *Pain.*—Much of the pain and discomfort of cancer of the stomach is due to obstruction, and should be avoided by the measures described above. There

PLATE XXXIV

PARTIAL GASTRECTOMY FOR CANCER OF STOMACH

(DONALD C. BALFOUR)

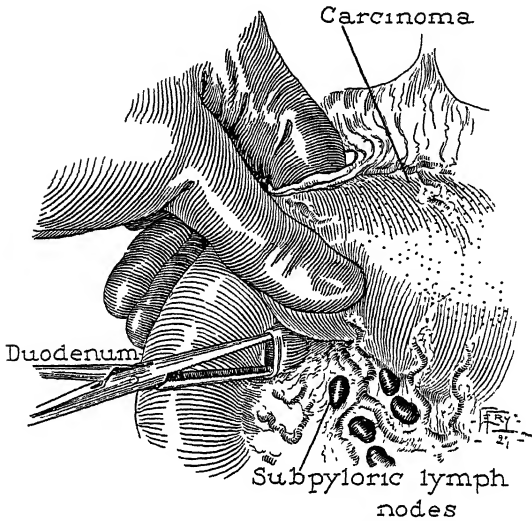


Fig. A.—Mobilization of pylorus, duodenum, and stomach; selection of a bloodless area in which to begin the division and ligation of the gastrocolic omentum.

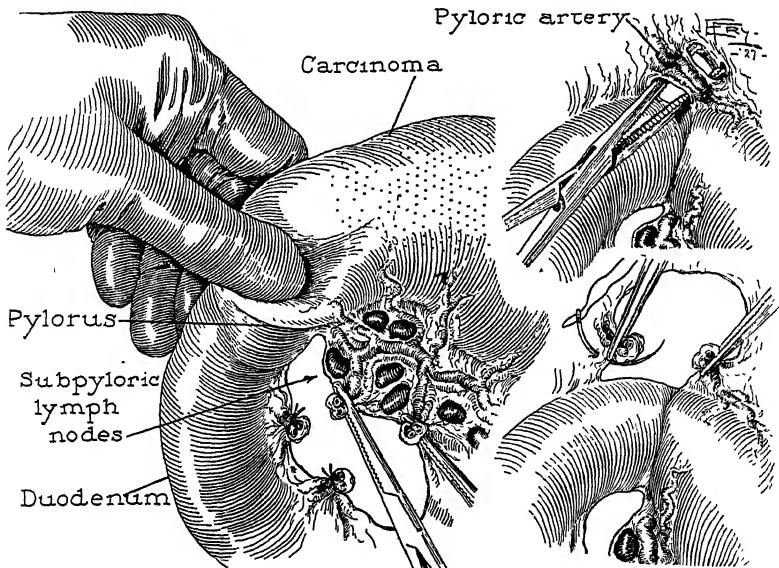


Fig. B.—Space opened in gastrocolic omentum, and division and ligation of the pyloric artery on the superior border of the duodenum.

PLATE XXXV

PARTIAL GASTRECTOMY FOR CANCER OF STOMACH—*continued*

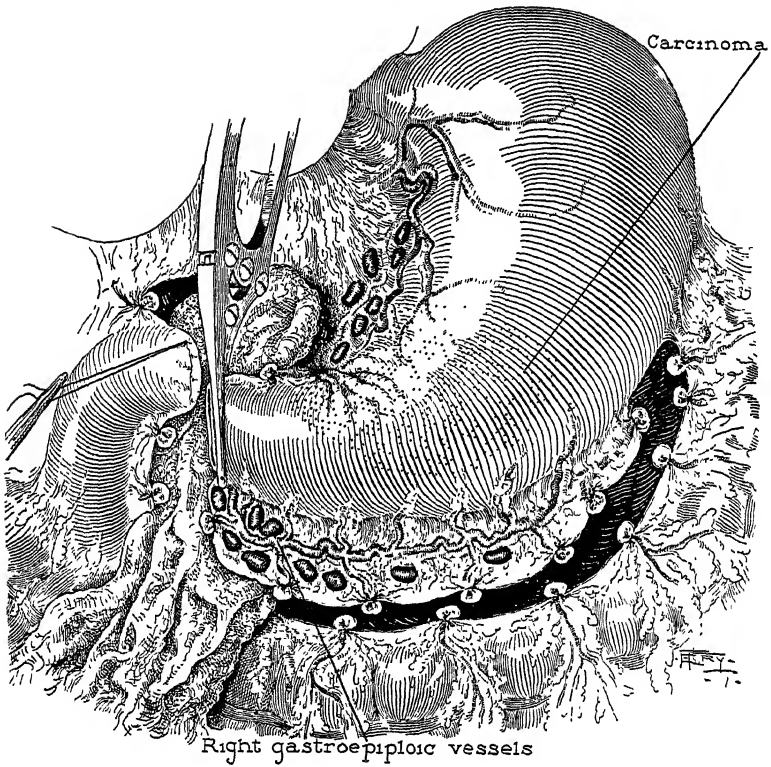


Fig. C.—Mobilization of the stomach. The gastrocolic omentum has been divided and ligated to a sufficiently high point on the greater curvature.

PLATE XXXVI

PARTIAL GASTRECTOMY FOR CANCER OF STOMACH—*continued*

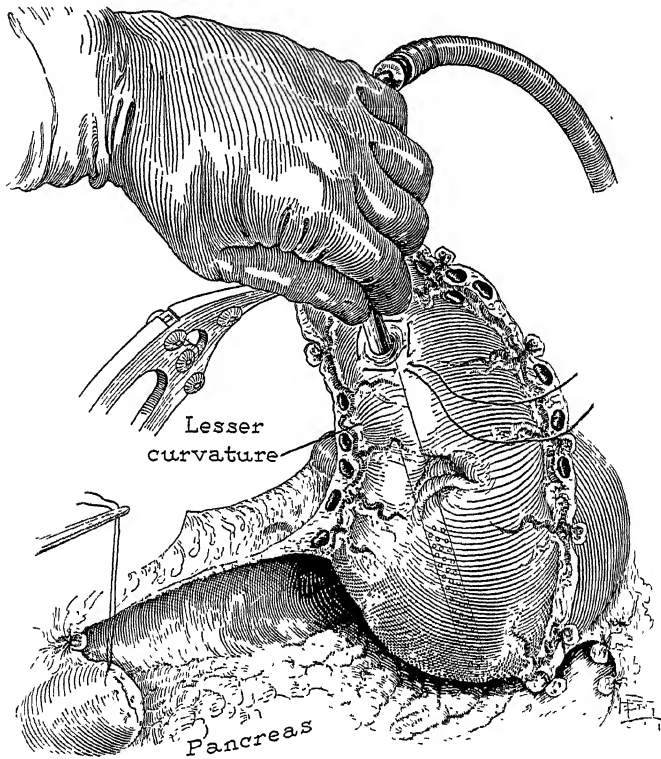


Fig. D.—The stomach being emptied by a suction pump.

PLATE XXXVII

PARTIAL GASTRECTOMY FOR CANCER OF STOMACH—continued

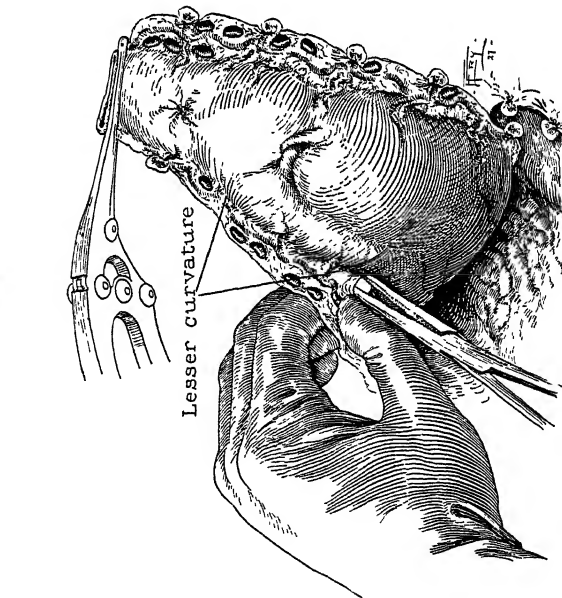


Fig. E.—Making an opening in gastrohepatic omentum prior to its clamping and division.

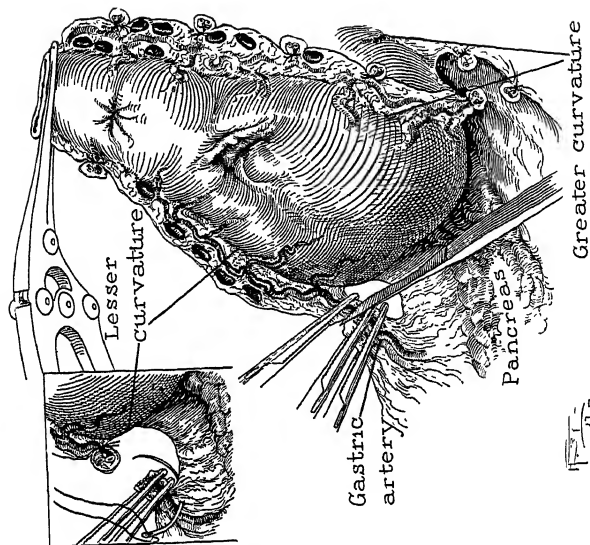


Fig. F.—Division and ligation of gastrohepatic omentum at site of gastric artery.

PLATE XXXVIII

PARTIAL GASTRECTOMY FOR CANCER OF STOMACH—*continued*

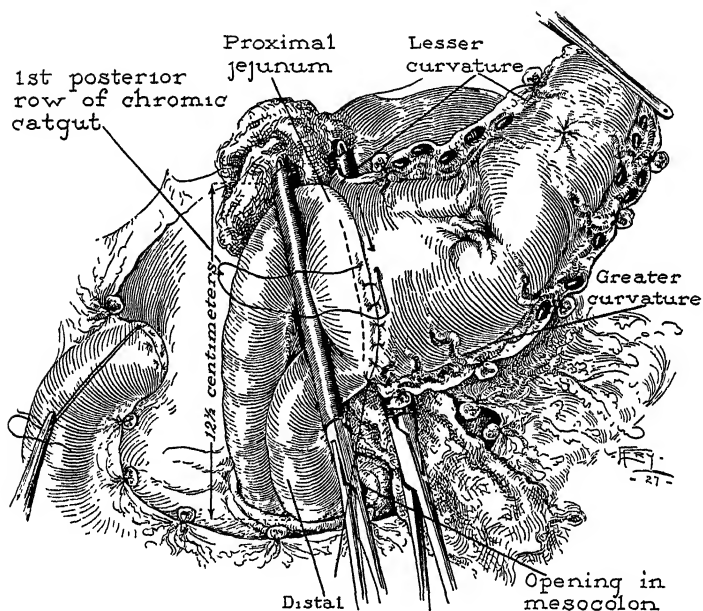


Fig. 6.—Arrangement of jejunum and stomach for posterior Polya anastomosis.

PLATE XXXIX

PARTIAL GASTRECTOMY FOR CANCER OF STOMACH—*continued*

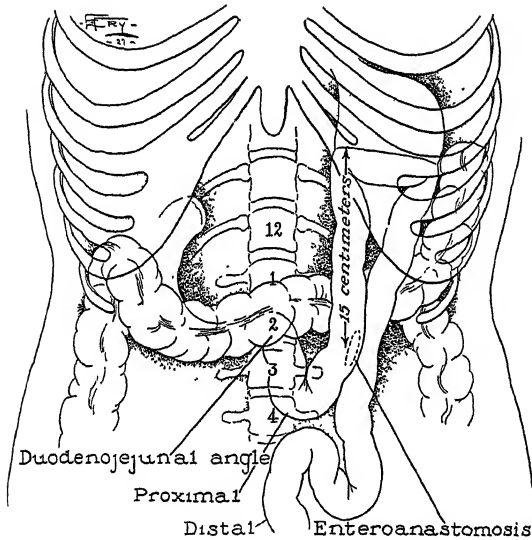


Fig. H.—The relation of the parts after the completion of an antecolic end-to-side anastomosis with an entero-anastomosis.

*Plates XXXIV-XXXIX are copied by kind permission from
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remain the pains of nerve involvement or due to the spread of the disease elsewhere. Analgesics such as Bromides, Pyramidon, Allonal, and Diacetate are often valuable in the early stages. Luminal is sometimes very effective in controlling nausea and vomiting.

When the diagnosis is quite definite and pain and discomfort are prominent, there is little to be gained by delaying the use of opiates. Much needless suffering is caused through the mistaken belief that a stage in the disease will be reached when morphia in any form will become ineffective. As regards cancer of the stomach, this is a profound error. It is seldom necessary to give more than small doses of Omnopon, or of such time-honoured preparations as Tinct. Chloroformi et Morphinae Co. or Tinct. Opii, in order to secure ease for the patient, provided that gastric lavage is used to allay the symptoms of obstruction.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1927, Jan. 29, 295; ²*Lancet*, 1927, 1, 1092.

STOMACH, CANCER OF (Surgical).

A. Rendle Short, M.D., F.R.C.S.

F. A. Bothe¹ conducted a research at the Mayo Clinic on the distribution of infection in the gastric lymphatic glands. Those most consistently affected were the glands near the entrance of the coronary vessels, and those on the greater curvature near the pylorus. E. R. Lampson,² and also D. C. Balfour and E. H. Hargis,³ remark on the very great accuracy of the X-ray examination after barium, if made by an expert. Other special tests are far less reliable. The latter writers strongly advise exploration in all cases in which there is not some obvious contra-indication such as metastasis. Every now and then one is rewarded by finding a growth less advanced than expected, or fixed merely by adhesions, or worth removal even in the presence of metastasis, to relieve symptoms. The patient should be prepared for operation by rest in bed, plenty of food and fluids, intravenous saline and glucose, and perhaps a blood transfusion.

The operative technique practised at the Mayo Clinic is described by Balfour,⁴ with numerous excellent illustrations, some of which we have been kindly permitted to reproduce (*Plates XXXIV-XXXIX*). The anæsthetic is morphia, then regional, then for the resection itself ethylene-oxygen-ether combination. The resection is started at the gastrocolic omentum at the inferior border of the duodenum, and the subpyloric glands are thus included in the part to be removed. The gastrocolic omentum is now divided as far as it is intended to remove. The gastrohepatic omentum is next freed and divided, the pyloric region freed, and the duodenum clamped, divided, and the stump closed. The stomach is now lifted over to the left, and is emptied if too distended. The gastrohepatic omentum has to be removed as high as possible, including all glands; a hole is made separating the omentum from the lesser curvature, and through this hole forceps are introduced to secure the coronary vessels in the gastrohepatic omentum. The stomach is then clamped. If there is no tension, the jejunum is brought through the transverse mesocolon, and a Pólya operation done, the proximal loop of jejunum being sutured to the lesser curvature and the distal to the greater. More frequently the anastomosis has to be made in front of the transverse colon, and in that case it is wise to unite the two long loops of jejunum by a jejunojejunostomy. Nothing is given by mouth for forty-eight hours, but the stomach is washed out. The death-rate in the 120 cases operated on during 1926 was 7.5 per cent.

End-results.—A series of 1000 cases at the Mayo Clinic showed that when the lymph glands were not involved, 52 per cent were alive and well after three years; when the glands were involved, only 19 per cent were alive. Lampson resected 17 cases for cancer in five years; 7 died; 3, however, were alive and

well over five years. X. Delore, P. Mallet-Guy, and J. Burlet³ report on 166 cases operated on by Delore from 1903 to 1926. Of the 130 who survived the operation, 88 have been followed up; of these, 22 lived over three years, but 8 of these subsequently died, so that the cures amount to 16 per cent. Two cases died of recurrence as late as six years after. Colloid cancer is more malignant than the other varieties.

Cancer of the Cardia.—P. Clairmont⁴ discusses the treatment of these very difficult cases. He is convinced that something should be attempted, because he and others have reported cures lasting over three years. His favourable case was treated by resection of the cardia followed by end-to-end œsophago-gastrostomy. In other cases end-to-side union may be used. If this cannot be done for lack of access, the last three ribs are resected on the left side, followed by retropleural exposure through the posterior mediastinum, passing round the left side of the aorta. If the continuity cannot be restored, an external fistula must be made.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1927, June, 761; ²*Boston Med. and Surg. Jour.* 1927, March, 468; ³*Amer. Jour. Med. Sci.* 1927, June, 773; ⁴*Surg. Gynecol. and Obst.* 1927, May, 659; ⁵*Presse méd.* 1926, xxxiv, 1250, and *Lyon chir.* 1926, Nov., 681; ⁶*Arch. f. klin. Chir.* 1926, cxi, 343.

STOMACH, INNOCENT GROWTHS OF. *A. Rendle Short, M.D., F.R.C.S.*

Less than one half per cent of gastric tumours are benign, but these are able to cause serious symptoms, and can be cured by operation. They usually occur in middle-aged persons, near the pylorus. The great majority are fibro-adenomatous polyps and fibromata. They may be asymptomatic, or may give rise to severe bleeding. In a few cases they interfere with the pylorus; others cause indigestion. The diagnosis is made by the X-ray examination, which shows rounded filling defects. D. C. Balfour and E. F. Henderson¹ report on 58 cases at the Mayo Clinic, all but one of which were removable by operation. The exception was a case of diffuse polyposis. Sometimes blood transfusion was needed to make the patient fit for surgery. Harold Brunn and Felix Pearl² publish 5 proved and 7 probable cases of diffuse gastric polyposis (*Plates XL, XLI*). The clinical picture was as described above. There was usually a very long history. In a few malignancy supervenes. Though the X-ray picture is highly suggestive, it may be mimicked by a hypertrophy of the folds of gastric mucosa. Of the 5 operated on with excision, 2 died, 1 did well, and 2 probably recurred.

REFERENCES.—¹*Ann. of Surg.* 1927, March, 354; ²*Surg. Gynecol. and Obst.* 1926, Nov., 559.

STOMACH, ULCER OF. (See GASTRIC AND DUODENAL ULCER.)

STREPTOCOCCUS INFECTION.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—P. Le Noir and R. Liège¹ report a fatal case of *streptococcal septicæmia* with primary joint lesions. The patient, a man of 30, was taken ill with high fever and inflammation of the right shoulder and elbow. The left knee and ankle and left elbow subsequently became affected. Blood cultures showed a hæmolytic streptococcus. Death took place after about a fortnight's illness. This unusual form of streptococcus infection reminds the writers of the case of streptococcus septicæmia reported by H. Cain and P. Oury in which the veins were primarily involved (see MEDICAL ANNUAL, 1925, p. 431).

TREATMENT.—W. Sanderson, N. B. Capon, and H. C. MacWilliam² record two cases of streptococcal septicæmia successfully treated by Concentrated Searlatinal Streptococcus Serum in doses of 10 c.c. intramuscularly, after

PLATE XL

DIFFUSE GASTRIC POLYPOSIS

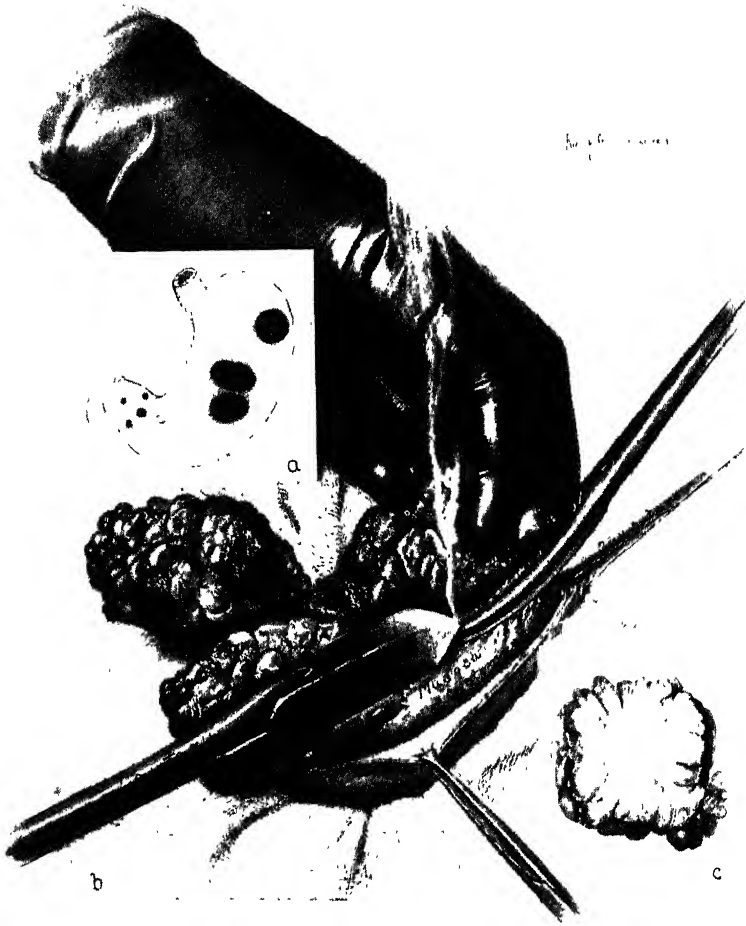


Fig. 1.—*a*, Number, size, and position of tumours. *b*, A large mass, clamped at its base, is being removed with cauterizing irons. The strip of healthy mucous membrane separating the polyps can be seen. *c*, Cross-section of a characteristic polyp, showing the fibrous core and the superimposed hypertrophic epithelium.

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PLATE XLI

DIFFUSE GASTRIC POLYPOSIS—*continued*

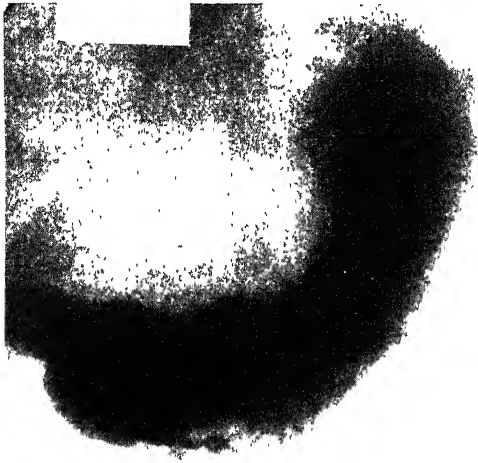


Fig. B.—Showing the extremely significant X-ray findings in another case. There was a marked irregularity of the greater curvature. At a second examination the irregularity of the greater curvature was proved to be characteristic of diffuse polyposis.

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other measures had failed. One was in a girl of 6½ years in whom the septicaemia was otogenic, and the other was a case of puerperal septicaemia in a woman of 34.

REFERENCES.—¹*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1927, 1243. ²*Lancet*, 1927, ii, 12.

SUBPHRENIC ABSCESS.

1. Rendle Short, M.D., F.R.C.S.

J. D. McEachern,¹ of Winnipeg, points out how severe the ordinary operation for subphrenic abscess is in an exhausted patient, and announces two excellent results in cases treated by a closed method of drainage. In the first he struck pus with the exploring needle in the tenth intercostal space behind, inserted a trocar, and by that means introduced a rubber drain. This was made airtight by packing round with cotton-wool and collodion. In the second case he had to make an incision to verify that the pleura was shut off before he ventured to repeat the above technique. Suction drainage was used.

The method has obvious advantages, with one important proviso. It is essential that we should be reasonably sure that the pleura will not be opened.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1926, Aug., 215.

SYMPATHECTOMY, PERI-ARTERIAL. (See VASCULAR SURGERY.)

SYNOVITIS, TRAUMATIC. (See SPRAINS AND TRAUMATIC SYNOVITIS.)

SYPHILIS.

Col. L. W. Harrison, D.S.O.

INCIDENCE.—The question of the decline, or otherwise, of syphilis in different countries of Europe in recent years has been investigated by Jadassohn¹ by means of a questionnaire addressed to 51 specialists in 19 countries. The answers from 14 countries were without exception to the effect that a decided reduction had occurred from 1919–20 to 1924–25. In the remaining countries there was a little difference of opinion on the question, with a preponderance in favour of a reduction except in the case of France. Here, according to Jeanselme, there had been a decline of about 50 per cent from 1919 to 1923, but in recent years a quite definite increase had occurred owing to the great influx of foreign workers and to the greater use of bismuth in substitution for arsenobenzene compounds. The opinion of Jeanselme that the indiscriminate use of bismuth is responsible to some extent for the recent increase of syphilis in France is interesting in view of the opinions of workers in countries where a decline has occurred which give the main credit for it to the use of salvarsan. The secret of success in combating syphilis (as in fact in combating all venereal diseases) is to render patients non-infective quickly, and undoubtedly the arsenobenzene compounds are far more effective in this respect than are the bismuth. A factor affecting the decline of syphilis in a community which appears to the reviewer to be important is continuance of the treatment. If a patient with syphilis in an early stage is treated with only a few injections of an arsenobenzene compound and of mercury or bismuth, he is apt to relapse in an infectious condition, and, from the point of view of preventing the spread of the disease, the treatment given in the first instance has been largely wasted.

By means of the questionnaire mentioned above, Jadassohn sought the opinions of the specialists throughout Europe on the view which has been expressed by a number of writers that salvarsan treatment has increased the incidence and hastens the onset of such late manifestations of syphilis as paresis, tabes, and aortitis. The general view expressed was that it was still too early to decide. A number of the specialists declared that they had never

seen a case which had been treated systematically from the first develop such sequelæ. In the MEDICAL ANNUAL for 1926, p. 449, the reviewer drew attention to an inquiry instituted by the Medical Society for the Study of Venereal Diseases to discover if there had been an undue incidence of neurosyphilis in the approximately 100,000 soldiers treated for syphilis during the war. This inquiry revealed a quite negligible number of such cases. In this connection an article by W. Kolle and K. Laubenheimer² is interesting. They present an analysis by stages of the disease of the cases providing sera with positive reactions sent to the State Institute for Experimental Therapy in Frankfort by the hospitals and private practitioners in the Frankfort area. The graph extracted from this article (Fig. 85) shows year by year, from 1910 to October, 1926, the percentages of the total sera from cases diagnosed as syphilis on clinical grounds which gave positive reactions; it affords no evidence to support the view that neurosyphilis and syphilis of the internal organs is increasing.

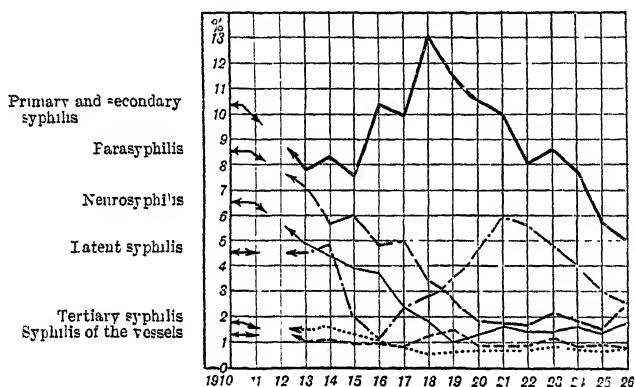


Fig. 85.—Graph showing percentages from 1910 to 1926 of sera from cases diagnosed as syphilis clinically which gave positive reactions, as tested at the Frankfort State Institute for Experimental Therapy. (Re-drawn from the 'Deutsche medizinische Wochenschrift'.)

IMMUNITY, REINFECTION, AND SUPERINFECTION.—The view commonly held by clinicians is that the acquisition of a fresh syphilitic infection by a person who has previously been syphilized is proof that the first infection has been eradicated, and in articles on results of treatment it is usual to find a certain number of instances of reinfection cited as evidence that such and such lines of treatment have been successful. This view has been contested by a number of workers, and the question has recently been reviewed at considerable length by R. Bernard,³ who concludes that superinfection is possible in persons still suffering from syphilis, whatever the stage. T. Hashimoto⁴ has succeeded in superinfecting 20 human subjects suffering from syphilis in various stages, and, contrary to the well-known finding of Finger and Landsteiner, did not find that the lesion resulting from the reinoculation corresponded in character with that to be expected in the stage of syphilis which the patient had reached. Clinical evidence, and even that from experiments on man, however, seems to leave one with a considerable amount of uncertainty, because, on the one hand, a very slight trauma can produce a recurrence of a syphilitic lesion in a syphilitic subject, and, on the other, one can hardly ever prove that the original infection has been eradicated. For this reason the evidence from experiments on animals, of which a considerable amount is now available, is

of great importance. Kolle⁵ showed that in rabbits which had been inoculated with syphilis, with the production of a primary lesion, and had then been treated with arsenobenzene compounds, the success of a subsequent reinoculation resulting in a primary lesion depended on the interval which had elapsed from the appearance of the primary lesion to the institution of treatment. The longer this was, the smaller the proportion of successes, until in cases where the infection had lasted ninety days or more the second inoculation practically never resulted in a lesion at the site of inoculation, however intense the treatment and in spite of this being prolonged for five or six months. Kolle concluded from these experiments that, if treatment was delayed so long as ninety days after appearance of the primary lesion, eradication of syphilis in rabbits was practically impossible.

Chesney and Kemp⁶ repeated Kolle's experiments, and found as he did with regard to the impossibility of producing a second primary lesion if treatment was delayed for a certain period. They did not, however, agree with Kolle's interpretation that this meant failure to eradicate the original infection, because in all their treated rabbits they had proved eradication of the original infection by the fact that material from the lymph nodes of these animals when inoculated into other rabbits did not produce syphilis. Further, Chesney and Kemp showed that in a certain proportion of their reinoculated animals, although no second primary lesion developed at the site of the reinoculation, nevertheless reinfection had occurred, as proved by the fact that they were able to infect other animals with lymph-node material from the reinoculated animals. In view of these results the authors suggested that, in cases of human syphilis which have been treated early and well but after being serologically negative for many months have become positive, the explanation may not be that the patient has relapsed but has become reinfected without the development of a primary sore. As to this, the reviewer is strongly inclined to believe that syphilitic infection without a primary sore occurs more often than is commonly thought, and he has seen at least two cases in which the primary lesion appears to have been prevented by the application of prophylactic antiseptic. It would not be right, however, to apply Chesney and Kemp's explanation to all cases which have relapsed after early and thorough treatment has been followed by long periods of absence of signs, since the reviewer has seen cases in which long periods of quiescence have been followed by recurrence of activity in the site of the original sore, and undoubtedly the patients have been reinfected by spirochaetes which have been locked up there even for some years.

Manteufel and Richter⁷ infected rabbits by intravenous injections. The result was that, although they showed no clinical signs and their serum reactions were negative, their lymph nodes were infective for other animals. Subsequently, in five out of six cases they were able to produce primary lesions in these animals suffering from latent syphilis by intrascrotal and intratesticular inoculation. They concluded that superinfection was possible in these cases because the original infection had evoked no interaction between virus and cutaneous tissues. There is also experimental evidence by Kolle and Schlossberger⁸ to show that a second inoculation may be successful though the first infection has not been eradicated, when another strain of *Sp. pallida* is employed, and by Brown and Pearce and others that a second primary sore may be produced when the first inoculation is carried out with an old strain and the second with a younger one. Altogether, the evidence seems to suggest that, if syphilis has been allowed to run on for a certain length of time, the cutaneous tissues develop a resistance to a second inoculation which persists long after the original infection has been eradicated; this may explain the

reviewer's impression that most of the human 'reinfections' recorded in the literature have been where treatment was instituted early in the primary stage. The evidence also suggests strongly that a second attack is not proof that the original one was eradicated, but only that cutaneous resistance has either never been developed or has disappeared in the absence of any recent interaction between spirochaetes and cutaneous tissues.

DIAGNOSIS.—H. Hecht⁹ relates a number of cases in which syphilis was overlooked, and unnecessary trouble inflicted on the unfortunate patients. They included the following, which could probably be matched by any syphilologist of standing. A soldier developed an ulcer on the lip and considerable swelling of submaxillary glands. These were treated as tuberculous, and the soldier was invalided from the service, though it required only a little investigation to show that they depended on a primary sore of the lip. A young man with gummata of the skin of the nose was treated for lupus, with X rays, etc. In one case high fever and headache appear to have put the physicians off the true diagnosis, though the patient evidently had a typical rash and general adenitis. An old woman had a foot amputated for a swelling which was gummatous, and a young man suffered a cholecystectomy for severe pain in the region of the gall-bladder, which proved to be due to a gastric crisis of tabes. The author recommends as routine a serological examination by the most delicate method possible. At the same time, as some of his cases show, even a serum test may not give the required clue, and may, in fact mislead by giving a negative reaction, and one would advise that in all cases where there is a doubt of any kind as to the diagnosis the possibility of a syphilitic infection should be considered. Perhaps the greatest pitfalls are in fevers, headaches and neuralgia, arthropathies, and testicular swellings.

The other side of the picture is presented by J. H. Mitchell¹⁰ in a paper on "The Menace of the Slightly Positive Reaction." He relates a number of cases in which a diagnosis of syphilis was made solely on the strength of a slightly positive reaction, or this in conjunction with some non-specific dermatosis, as pityriasis rosea (a great pitfall) or lichen planus. As a result of the diagnosis, in some of the cases which have come to the notice of the author, marriage engagements have been broken, or divorce proceedings instituted, and he considers that this 'slightly positive' reaction was without a rival in the generation of syphilophobia until the advent of the Abrams machine. The reviewer's advice to students and patients has always been never to accept a 'doubtful' or a 'slightly positive' report as sufficient evidence for a diagnosis of syphilis in the first instance, and invariably in cases which give a definitely positive reaction without other evidence to have the test repeated at once. The term 'slightly positive' should be abolished and 'doubtful' substituted.

A negative Wassermann reaction is rightly regarded as of slight value in proving the absence of syphilis, but it is common practice, in cases which are under observation after undergoing treatment, to test the blood at intervals of some months. A disadvantage of this method is that in some cases, independently of treatment, the serum may sometimes be positive and sometimes negative at very short intervals of time; in one of the reviewer's cases the alternations were almost weekly. S. S. Greenbaum and E. Yagle¹¹ examined specimens of serum from 50 cases of syphilis on each of 12 consecutive days by the Wassermann test (Kolmer method) and the Kahn flocculation test. In eight of the cases the reactions were sometimes positive and sometimes negative to one or other of the two tests. In only two of the cases, however, were the reactions negative to both tests on the same day. The authors conclude that the safe course is to test each specimen by both the Wassermann and a flocculation test.

It is occasionally useful to test a recently delivered woman serologically without her knowledge. H. G. Rottmann and H. Franken¹² show that in a syphilitic woman the milk will give a positive reaction during the time it contains colostrum. The original paper should be consulted for details of the technique of preparing the milk for the test.

Laboratory Tests of the Serum and the Cerebrospinal Fluid.—The usual source of the extract used in Wassermann and flocculation tests is heart muscle, and the common idea appears to be that it is of little moment from what animal the heart is obtained. S. B. Hooker,¹³ confirming the work of Ruediger and of Taniguchi, shows that there is a danger of false positives resulting from the testing of human sera containing much anti-sheep's-cell lysin (most human sera contain some of this lysin) when extracts of hearts from certain animals are used. Ruediger (1919) tested 50 sera from clinically non-syphilitic persons, using antigen derived from heart of man, ox, rabbit, sheep, dog, and guinea-pig, and obtained false positives with dog- and with guinea-pig-heart extracts. Taniguchi found that a serum rich in anti-sheep-lysin fixed five times as much complement with guinea-pig-heart extract as with human or with ox-heart extract, while another serum containing no anti-sheep lysin fixed the same amount of complement with each of the three extracts mentioned. Hooker showed that sera rich in anti-sheep-cell lysin gave false positive reactions to the Kahn flocculation test when horse-heart extract was used.

The use of ethyl alcohol in the preparation of extracts for serum tests may, in certain circumstances, be expensive. Isham¹⁴ shows that isopropyl alcohol, which is much cheaper, makes better extracts. The addition to the diluted antigen used in the Wassermann test (Kolmer method) of formalin (Merck's blue label) in a proportion of 1-1000 has been shown by C. E. Reyner¹⁵ to increase the velocity of the reaction. The Meinicke turbidity reaction is not employed greatly in this country, possibly because of technical difficulties of carrying it out in its original form, and because the extract must be obtained from Meinicke's laboratory, Hagen, Westphalia. Meinicke,¹⁶ however, published a micro-test which R. M. Clark¹⁷ reports to be very simple and rapidly carried out. Two platinum loops, one holding five times as much as the other, are employed. To a large loopful of the diluted extract is added a small loopful of unheated serum, and a hanging-drop preparation is made of the mixture, which is examined microscopically in an hour. In a positive reaction, clumps are seen in all planes of the hanging-drop. Clark, in his comparison of this test with the ordinary Wassermann, shows a very close concordance.

It is possible that in the near future no cerebrospinal fluid will be considered to have been tested thoroughly unless it has been searched for *Sp. pallida* itself. W. Schönfeld and H. Krey¹⁸ have repeated the work of Wile and Kirchner,¹⁹ who reported on the finding of *Sp. pallida*, or fragments of such, in 12 out of 116 sediments of spinal fluid, some of which were negative to other tests. The method employed is to add alcohol to the fluid, spin this out in the centrifugal machine, and treat the small clot obtained as if it were tissue to be examined for spirochaetes. Schönfeld and Krey, to whose paper reference must be made for technical details, found *Sp. pallida*, or fragments of this organism, in 12 out of 17 fluids from syphilitic patients; 12 of the specimens were negative to other tests, and in 5 of these definite spirochaetes were seen, while in 4 others were fragments of two to four coils.

Radio-diagnosis.—A. Léri and P. Cottenot²⁰ report nine cases of late syphilis in which other tests were negative but radiograms of the skull revealed lesions of the inner table, and the resulting specific treatment quickly led to relief of such troubles as epilepsy, persistent headaches, and hemiplegia. Heuser²¹ describes a new sign of syphilis in the form of exostoses or roughness of the

iliac crests disclosed by X-ray examination. In a patient sent for cholecystography the finding of such an exostosis led to a diagnosis of syphilis, which had hitherto been unsuspected. Exostoses may develop also on the pubis, the ischiopubic rami, or the acetabula.

Visceral Syphilis.—In patients with syphilis of the liver, arsenobenzene treatment is generally harmful; but the response to iodide and mercury, particularly iodide, is so good if the treatment is applied promptly that the recognition of hepatic syphilis is very important. T. McCrae and W. R. Caven²² report on a thorough clinical analysis of 100 cases, of which 5 were congenital. In one of these the patient was under 10 years of age, and in the remaining 4 they were from 11 to 20. In the 95 acquired cases 20 were of ages from 21 to 30, 60 from 31 to 50, and the balance from 51 to 70. In 55 cases there was a clear history of steady use of alcohol, 23 of them to excess. The chief complaints by the patients were swelling of the abdomen in 46 cases, pain in 37, jaundice in 8, shortness of breath in 16, loss of weight in 7, oedema of the legs in 7, vomiting in 5, fever in 2, chills and fever in 5. Further inquiry and examination showed as follows: loss of weight varying from 15 to 50 lb. in 54 cases, ascites in 10, jaundice in 40, abdominal pain in 61, and elevation of the temperature in 81. The Wassermann reaction was negative in 8 out of 41 cases in the last portion of the series, and the authors suggest that the blood is negative in a larger proportion of hepatic than in other forms of visceral syphilis. Ascites was present in 42 cases, and the spleen was palpable in 50. The liver in the congenital cases showed much the same features, being generally enlarged, with a large, rounded, smooth mass or masses in the epigastrium. In the acquired cases a striking feature was the relatively greater involvement of the left lobe in comparison with the right. The liver was enlarged, or showed a tumour mass, in 89 cases, and in 49 the left lobe was particularly prominent. There was general enlargement without gross irregularity in 43 cases, enlargement with nodules in 29 cases, and enlargement with a large prominence or boss in 16. In a number of the cases previous medical attendants had been led astray, and one gains the impression that fever had been the chief cause in diverting the physician from the right path, tuberculosis, hepatic abscess, or cholecystitis having been suspected in some of the cases. For details of the diagnostic procedure the original paper should be consulted, but it is worthy of note that the authors include a therapeutic test, because in syphilis of the liver the results of treatment on right lines are so striking. In many cases the temperature falls to normal in forty-eight hours, and in two or three weeks there is a marked decrease in the size of the liver and the nodules; in some cases the spleen also shows a remarkably rapid decrease in size. In treatment the authors use *Mercurey* and *Iodide*, but lay particular stress on the iodide, which alone may give a perfect result as regards relief of symptoms. The authors say that arsenobenzene preparations are absolutely contra-indicated in most cases of syphilis of the liver.

The frequency of syphilitic changes in the organs, particularly of *aortitis*, is the subject of a paper by E. Langer,²³ who reviews the findings in over 70,000 post-mortem examinations, including 23,015 in his own institute, carried out from 1906 to 1925. In his own material, evidence of syphilis was found in 5.5 per cent of cases, and in these, though the autopsies of women equalled those of men, the occurrence of syphilitic changes was 1.6 times as great in men as in women; this compares with the finding of Gürich²⁴ of a proportion of 2.2 to 1 but there were fewer women in Gürich's material. While the percentage of cases in which syphilitic changes were found was little different (4.32 per cent) in 1925 from that in 1906 (4.02), the percentage of the syphilitics in which *aortitis* was found was very much greater, being 83.87 in 1925 and 33.3 in

1906. Langer's finding that aortitis was 2·7 times as frequent in syphilitic corpses in 1925 as in 1906 is in close agreement with that of Jungmann and Hall, who made the figure 2·5. In another table the author shows that the life of the syphilitic is shortened. In men both before and after 1915 the highest number of deaths occurred between 46 and 60, with the peak between 51 and 55. In women it appears to have been mainly between 36 and 40 before 1915, and between 46 and 50 after this year. Melchior found in 378 cases that, while 65·4 per cent of the syphilitic corpses were of subjects between 30 and 60 years of age, only 46 per cent of those who had died of other diseases were in this age period. Again, in the age period from 61 to 70 were 25 per cent of the syphilitic corpses as compared with 46 per cent of those dead of other diseases. The table below, condensed from one furnished by the author, shows the greater frequency of aortitis discovered in the decennium 1916 to 1925 as compared with 1906 to 1915, and also the relative frequency of aortitis to syphilis of other organs, excepting the central nervous system :—

Diagnosis	Total cases	
	1906-15	1916-25
Aortitis, clinically and by section ..	84	200
" by section only ..	187	250
" clinically only ..	9	12
" with syphilis of liver ..	33	19
" " syphilis of kidney ..	12	10
" " respiratory syphilis ..	15	13
" " bone syphilis ..	10	2
" " syphilis of genital organs ..	6	9
Liver syphilis without aortitis ..	56	39
Kidney syphilis without aortitis ..	10	1
Respiratory syphilis without aortitis ..	29	7
Bone syphilis without aortitis ..	33	4
Genital organ syphilis without aortitis ..	13	3
Total aortitis ..	356	515
" liver syphilis ..	89	58
" kidney syphilis ..	22	11
" respiratory syphilis ..	44	20
" bone syphilis ..	43	6
" genital organ syphilis ..	19	12

Thus the author's figures show, in the second decennium dealt with, a decline in the cases found with syphilis of other organs, except the central nervous system, and an increase in syphilitic aortitis. In this they agree with the statistics of Gürich and of Jungmann and Hall, amongst others. He quotes Willmanns and others to show that parenchymatous neurosyphilis has also increased, and aligns himself with those who believe that the responsibility for the increase in both these forms of syphilis rests with the intensity of the modern treatment, particularly with salvarsan compounds, which interfere with the development of an immunity against *Sp. pallida*. He quotes also the view of Willmanns that the modern treatment shortens the interval between infection and the later manifestations dealt with, and in support mentions the findings of Jungmann and Hall that in 110 cases the interval between infection and the first sign of the late manifestation was in the untreated 23·4 years, in the indifferently treated 22·1 years, and in the well-treated 15·0 years. He does not agree with Hoffmann, Almquist, and many others that the treatment should be intensified, holding that it should be as mild as possible so as to support rather than interfere with the natural resistance of the tissues.

Langer's paper has been reviewed at some length chiefly to show the proportion of cadavera in which syphilitic changes have been found, and the high

proportion of these in which aortitis, *when it is searched for*, is discovered. Before accepting his statistics as evidence that aortitis has increased in recent years, one would require proof that this manifestation of syphilis was looked out for and noted as diligently throughout the first decennium as the second. In this connection the author throws an interesting side-light when he quotes Copolla as having found aortic disease in 86.93 per cent of cases of tabes and general paresis, and in the next sentence quotes Coenen as having found an increase from 22 per cent in 1908-14 to 42.9 per cent in 1919-25 in the same class of cases. As to the increase in parenchymatous neurosyphilis, on which the author quotes various workers, the reviewer has shown that so far there is no evidence of this in England and Wales, and would also refer to the inquiry by Jadassohn, reviewed above, which elicited the opinion from a large number of specialists throughout Europe that it is as yet too early to decide this question.

Endocrine Derangement from syphilis has been studied by Récamier²⁵ in twenty-one women and girls suffering from congenital syphilis. The leading symptoms were lassitude, especially in the morning; headache, most frequently before menstruation; and troubles which are apt to be assigned to simple neurasthenia without search for any specific origin. The troubles are aggravated by changes at puberty and the menopause and by childbirth. Marriage with a non-syphilitic may result in one daughter but no other children, and the stigmata may be more evident in the child than in the mother. The syphilitic origin of the disturbance was shown by the effect of treatment. Besides antisyphilitic treatment, the author considers that **Organotherapy** is indispensable in these cases. A. Gange²⁶ records the case of a girl who, in addition to characteristic signs of congenital syphilis, showed *Marañon's syndrome*, viz., acrocyanosis of the hands and feet, with dampness of the palms and a swelling of the soft tissues of the palms, which Marañon attributed to ovarian incompetence. The patient also showed signs of hypothyroidism. J. R. McCord²⁷ records a case of congenital syphilis in which a search of all the organs and of the placenta revealed evidence of syphilis only in the thymus, which contained *Sp. pallida* in large numbers. A skiagram of the bones showed none of the changes believed to be characteristic of syphilis.

Syphilitic Pleurisy.—Two cases are reported by G. Macciotta²⁸, both patients with well-marked congenital syphilis, one 3½ years and the other 2 months old. The pleurisy, which was bilateral in the first case, was dry at first and characterized by an unusually rasping rub. The onset had been accompanied by great restlessness and pain, and the cough was suggestive of pertussis. There was no evidence of involvement of the lung. In both cases the signs cleared up under **Arsenobenzene** and **Mercury** after salicylates and iodides had failed.

Congenital Syphilis.—D. L. Belding²⁹ concludes, from a statistical survey of the families of 190 women with positive serum reactions, that women who show no clinical signs of syphilis and have had the disease for five or more years seldom give birth to syphilitic children. In women who give positive serum reactions but show no clinical signs, one-third of all foetal deaths are due to syphilis, while in those who show clinical signs of syphilis the proportion of foetal deaths due to this disease is two-thirds. The uncertainty as to the transmission of syphilis is exemplified by a case reported by Castorina³⁰ in which the male of a pair of twins was apparently free from syphilis while the female had a positive Wassermann reaction, enlargement of the liver and spleen, and Mongolian habitus. The reviewer has seen two similar cases, and would refer to Boas and Gammeltoft,³¹ in whose series was a case of a woman with secondary syphilis who gave birth to a healthy infant. Such uncertainty

makes it difficult to formulate rules for the marriage of syphilitics which will absolutely insure against transmission to the offspring; but it can be said with very fair certainty that, if all syphilitics were to wait for five years before marrying, being well treated in the meantime, and all women with a history of syphilis were treated throughout each pregnancy, congenital syphilis would become extremely rare. (See also p. 476.)

TREATMENT.—Resistance of *Sp. pallida* has been cited as a possible explanation of the indifferent response of some patients to treatment. E. Hoffmann and G. Armuzzi³² relate a case in which the soil and not the seed was responsible. A young woman with severe secondary lesions continued unaffected by arsenobenzene, mercury, and bismuth, until Zittmann's Sweating Cures had been instituted. Rabbits were infected with secretion from open lesions after six injections of sodium-salvarsan had been given. The rabbits were cured by normal doses of arsenobenzene.

Accidental injection of arsenobenzene solution around instead of into a vein is treated by Dietal on the following plan: As soon as it is obvious that the solution has entered the tissues, the syringe is detached and an empty one applied to aspirate as much as possible of the misplaced solution. Then 10 c.c. of physiological saline are injected into the affected tissues. Landemann and Worowitzky³³ speak well of the method.

Perez³⁴ shows that the percentage failure of Bismuth treatment *in pregnancy* is as high as that of mercurial treatment, and far higher than with arsenobenzene, mercury, and iodides in conjunction. *Accidents from bismuth injections* are very uncommon. The most serious is embolus resulting from accidental injection of the suspension into a vein. The reviewer, in the MEDICAL ANNUAL for 1925, p. 442, gave reasons for a belief that embolus was more likely to happen from bismuth than from mercurial injections, and advocated the employment of the deep subcutaneous route in preference to the intramuscular. E. Gaujoux and G. Barbier³⁵ review the literature and relate their own experience of a type of accident due to accidental injection of the remedy into an artery. The result is very severe pain and swelling, followed by signs varying from ecchymotic patches in the skin of the gluteal region to necrosis of areas of the skin and subcutaneous tissues. The authors advise the usual precautions when giving intramuscular injections—inspection of the needle base before fitting the syringe, and a pull on the piston before injecting—but a more certain method of avoiding such accidents is, in addition to these precautions, to inject into the tissues immediately overlying the gluteal fascia, as here the vessels are smaller and less likely to be injected.

Voegtlin and Dyer³⁶ have shown that the minimum single sterilizing doses of Arsenobenzene preparations for rabbits infected with syphilis are, for '606', 23.5 mgrm. per kilo. body weight; for '914', 40 mgrm.; and for sulpharsphenamine, kharsulphan, myosalvarsan, sulfarsenol, sulphostab, and similar compounds, 35 mgrm. These doses are far above those commonly considered to be the maxima which can be tolerated, which are, for '606', 10 mgrm per kilo., and for '914', 15 mgrm. The authors suggest that, as it would be an advantage to approach in individual doses as closely as possible to the minimum sterilizing, Sodium Thiosulphate might be employed simultaneously with the arsenobenzene preparation. In agreement with Dale³⁷ they found that sodium thiosulphate did not interfere with the therapeutic power of arsenobenzene. They think that, instead of giving sodium thiosulphate intravenously, it might be administered orally in doses of 2 grm. dissolved in 100 to 200 c.c. physiological salt solution before breakfast. The reviewer has adopted the plan in cases where it is desirable to push the arsenobenzene treatment and in those showing signs of intolerance. For intravenous injection of '914' the dose is dissolved

in 10 c.c of a 10 per cent solution of pure sodium thiosulphate. When the deep subcutaneous route is employed, the patient takes 30 gr. of sodium thiosulphate in half a tumblerful of water each morning before any food.

Driver, Gammel, and Karnosk³⁸ review the results obtained by thirty-six observers in different parts of the world by the Malarial Treatment of general paralysis. They show full remissions in 27.5 per cent and incomplete remissions in 26.5 per cent. F. Bering³⁹ and G. Scherber⁴⁰, in agreement with Finger and others, recommend that, in cases of syphilis where the cerebrospinal fluid remains positive in spite of ordinary treatment, malarial inoculation should be employed in addition. J. F. Schamberg and A. M. Rule⁴¹ review the mode of action of malarial therapy, and relate some experiments on rabbits which go to show that it is not the malarial toxin but the fever which destroys the spirochaetes. Rabbits injected with malarial plasmodia after syphilitic inoculation all developed syphilis, as did also 2 out of 3 injected with Coley's fluid, but only 1 of 20 rabbits which had hot baths in such a way that their temperatures rose considerably. In the case of the single failure the rabbit had had only one bath, which had resulted in a rise from a normal of 100.6° to only 105.8°.

Moore and Kemp⁴² have analysed their results in 402 cases of early syphilis. They show that the proportion of success depends on the earliness and the amount of treatment. Only 10 per cent of patients receiving eight or less injections of arsenobenzene were cured, and the percentage of cures reached 78.8 per cent only after four or more courses. In sero-negative primary cases they found cures in 13 out of 14 with three to four or more courses of arsenobenzene, with mercurial inunctions in the intervals.

[*The Treatment of an Average Case of Primary Syphilis in an Adult Male of Average Weight.*—A close study of the records of male cases of syphilis at the St. Thomas's Hospital V.D. centre has confirmed my view that in primary syphilis with a negative Wassermann reaction not less than two courses of Arsenobenzene and Mercury or Bismuth should be given. Each course should amount to 6 grm. of '914' (or equivalent, if another type of arsenobenzene compound is used) given in ten doses rising from 0.45 grm. to 0.75 grm. over a period of three months. Personally, I believe that better results are obtained by giving the arsenobenzene preparation deep subcutaneously, using khar-sulphan, myosalvarsan, sulfarsenol, or sulphostab. Bismuth in doses of 0.3 to 0.4 grm. of the metal should be administered at the same time as the arsenobenzene, so that the total in the course is 3 to 4 grm. In the interval of two months between the two courses, Potassium Iodide should be taken. In addition to the general treatment, the local sore should be attacked by excision, inunction with mercurial ointment, or, perhaps best of all, injection with 0.1 grm. '914' dissolved in 0.5 c.c. water. In sero-positive primary and early secondary cases I would give a third, similar course, and more than this if the serum reactions at the end of the first course have not been rendered completely negative. In tertiary cases with ulceration I give potassium iodide from the first, and find it usually well tolerated when prescribed in a cent per cent solution (1 oz. KI in 1 oz. water). The dose is measured in drops and put into half a tumblerful of milk, being 15 drops a day for three days; 20 a day for four days; 20 twice a day for a week; and 20 three times a day for two weeks. Arsenical and bismuth injections are commenced at once, and unless there are contra-indications in the form of visceral or nervous disease, the dosage follows much the same lines as in earlier cases. Visceral or nervous complications demand caution with the arsenobenzene, the smaller individual dosage being compensated for by giving the injections twice a week instead of once. The number of courses depends on circumstances. The serum

reactions are obstinate, and some would treat only symptoms. I would advocate at least three courses, and would then consider a long rest if the reactions had remained completely obstinate.—L. W. H.]

REFERENCES.—¹*Klin. Woch.* 1926, v, 2248; ²*Deut. med. Woch.* 1927, Jan. 1, 3; ³*Bruz. méd.* 1926, vii, 71 and 105; ⁴*Ibid.* vi, 1362; ⁵*Deut. med. Woch.* 1922, 1301, and 1924, 1234; ⁶*Jour. Exper. Med.* 1926, xlv, 589; ⁷*Deut. med. Woch.* 1926, 2113; ⁸*Ibid.* 1926, July 23, 1245; ⁹*Ibid.* Nov. 12, 1933; ¹⁰*Jour. Amer. Med. Assoc.* 1926, Oct. 23, 1351; ¹¹*Ibid.* 318; ¹²*Klin. Woch.* 1927, vi, 66; ¹³*Jour. of Immunol.* 1926, May, 403; ¹⁴*Amer. Jour. Syph.* 1927, Jan., 146; ¹⁵*Ibid.* 233; ¹⁶*Med. Klinik*, 1925, No. 4, and *Derm. Woch.* 1925, No. 26; ¹⁷*Jour. of Ment. Sci.* 1926, Oct.; ¹⁸*Munch. med. Woch.* 1927, No. 10, 412; ¹⁹*Arch. Dermatol. and Syph.* 1923, viii, 831; ²⁰*Presse méd.* 1926, June 26, 801; ²¹*Rev. de Especial.* 1926, Nov., 537 (abstr. *Jour. Amer. Med. Assoc.* 1927, Feb. 19, 612); ²²*Amer. Jour. Med. Sci.* 1926, Dec., 781; ²³*Munch. med. Woch.* 1926, Oct. 22, 1782; ²⁴*Med. Annual.* 1926, 448; ²⁵*Ann. des Mal. Vén.* 1926, June, 401; ²⁶*Gaz. des Hôp.* 1926, Sept. 1 and 3 (abstr. *Brit. Med. Jour. Erit.* 1926, ii, 91); ²⁷*Amer. Jour. Obst. and Gyn.* 1926, Dec., 890; ²⁸*Pædiatria*, 1926, Oct. 15, 1097 (abstr. *Brit. Med. Jour. Erit.* 1926, Dec. 25, 99); ²⁹*Amer. Jour. Syph.* 1927, 73; ³⁰*Pædiatria*, 1926, July, 731 (abstr. *Jour. Amer. Med. Assoc.* 1926, Sept. 19); ³¹*Acta Gyn. Scandinav.* 1922, i, fasc. 3; ³²*Deut. med. Woch.* 1927, lvi, 51; ³³*Munch. med. Woch.* 1926, Aug. 7, 1442; ³⁴*Bol. Soc. de Obstet. y Ginecol.* 1926, Oct. 16, 387 (abstr. *Jour. Amer. Med. Assoc.* 1927, Jan. 1); ³⁵*Marseille-méd.* 1926, Nov. 15 710; ³⁶*Pub. Health Rep. Washington*, 1927, xli, 1045; ³⁷*Erit. Jour. Ven. Dis.* 1925, July, 224; ³⁸*Jour. Amer. Med. Assoc.* 1926, Nov. 27, 1821; ³⁹*Munch. med. Woch.* 1926, lxxii, 2016; ⁴⁰*Wien. klin. Woch.* 1926, Nov. 11, 1325; ⁴¹*Arch. of Dermatol. and Syph.* 1926, Sept., 243; ⁴²*Bull. Johns Hop Hosp.* 1926, July, 36

SYPHILIS, CARDIOVASCULAR.

A. G. Gibson, M.D., F.R.C.P.

G. H. Colt¹ analyses in 447 cases the duration of life in British-born subjects suffering from sacular aneurysm. The paper is illustrated by graphs which give the main results. It should be consulted in the original.

H. L. Heimann² analyses 105 cases of cardiovascular syphilis, all of which showed a positive Wassermann reaction. In the first twenty years of its course it is mainly latent; once, however, symptoms show themselves, its course is rapid. The author distinguishes two types: in 81 there was aortic regurgitation; in the remaining 24, though there was cardiac enlargement or some other sign, there was no valvular lesion. The important symptoms of beginning failure are shortness of breath, cardiac pain, giddiness, palpitation, fainting attacks, in that order of frequency. The symptoms complained of by patients in both groups are the same. Enlargement of the heart was present in 96 per cent of the valvular group and in 94 per cent of the non-valvular. The blood-pressure (systolic) tends to be raised, and especially in the valvular group, though not confined to it; the leg pressure is greater than the arm pressure. Incidentally the author mentions S. Goodall's dictum that for a given degree of aortic regurgitation the better prognosis is in those with a greater difference in pressure between these two points. The enlargement of the heart was not due solely to aortic regurgitation, but had relation to the systolic blood-pressure and the state of compensation. It was ascertained that of 19 cases of aneurysm the prognosis had no relation to the height of the blood-pressure. Cardiac pain, if mild at first, tended to become severe. There were 10 cases of auricular fibrillation and 21 cases of heart-block. Electrocardiographically, over half the cases investigated showed a preponderance of the left ventricular type. In 25 cases there was a small notch on the ascending limb of the R wave, and the author suggests that if this is discovered in any electrocardiogram a Wassermann reaction should be taken. The signs of cardiac failure are of grave significance. Treatment by arsenobenzol compounds is not recommended for the later stages of cardiovascular syphilis. The author relies on large doses of Potassium Iodide combined with Mercury, often with Digitalis. Injections of Horse Serum twice weekly in two cases of aneurysm of the aorta greatly relieved the pain, supposedly by stimulating the formation of clot.

In early syphilis cardiovascular complications are rare. This is the conclusion reached by K. B. Turner and P. D. White³ in a study of 50 cases of syphilis in the primary and secondary stages when first seen. The shortest period of infection before a case of cardiac disorder presented itself was 13½ months. They excluded all cases in which previous rheumatic or coronary disease might complicate the diagnosis. In no case was there any justification for the diagnosis of a syphilitic cardiac lesion.

REFERENCES.—¹*Quart. Jour. Med.* 1927, April, 331; ²*Brit. Med. Jour.* 1927, i, 133, ³*Arch. of Internal Med.* 1927, Jan., 1.

SYPHILIS OF THE CENTRAL NERVOUS SYSTEM. (See also DEMENTIA PARALYTICA; TABES DORSALIS).

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

Diagnostic and Prognostic Significance of Cerebrospinal Fluid.—With regard to the relative diagnostic value of the various serological reactions in the recognition of neurosyphilis, H. F. Watson¹ has made a careful evaluation of various tests in a series of 350 cases, 119 of which were syphilitic. He concludes that of the various tests the Wassermann reaction gives the highest percentage of positive results in known syphilitic cases, and is of the highest diagnostic significance. The Lange colloidal gold reaction is of less diagnostic value than the Wassermann, and it would be unwise to use it as a substitute, inasmuch as paretic and luetic gold curves are not confined to syphilitic conditions, but have been observed with encephalitis, disseminated sclerosis, and other non-syphilitic maladies. Next in value to the Wassermann reaction are the various globulin tests, especially the Noguchi butyric acid test, and the Ross-Jones ammonium sulphate test. In certain non-syphilitic conditions, all the protein tests, like the Lange gold test, may yield positive results. We should therefore supplement chemical reactions in the fluid by a cytological examination, carefully counting the number of cells by means of a counting chamber. A lymphocytosis of 10 cells or upwards per c.mm. is always pathological. Some observers even place the upper limit of normality at 5 cells per c.mm. The sound clinician therefore will never base his diagnosis on a single laboratory reaction, but will be careful to study all the available data, both clinical and serological, before coming to a conclusion.

TREATMENT.—Encouraged by reports on the efficacy of *Tryparsamide* in cases of African sleeping sickness, this drug is now being extensively tried in the treatment of neurosyphilis. J. R. Moore and I. C. Sutton² believe that those patients who have already received assiduous treatment by means of mercury and the salvarsan group show more striking improvement than patients who have received no preparatory treatment. The previously treated patient also seems less subject to the Herxheimer-like flare-ups so often seen during the first course of *tryparsamide* injections. It is emphasized by these observers that *tryparsamide* is primarily a resistance builder and a healer of syphilitic lesions, but not a spirochæticide. This fact precludes its use in early syphilis. Its greatest value therefore is in general paralysis, in late *tabes dorsalis*, and in selected cases of neurosyphilis which have resisted systematic intravenous and intrathecal treatment by other remedies.

REFERENCES.—¹*Quart. Jour. Med.* 1926, July, 431; ²*Jour. Nerv. and Ment. Dis.* 1926, June, 569.

SYPHILIS, CONGENITAL. (See also p. 472.) *Reginald Miller, M.D., F.R.C.P.*

The arsenicals still hold the first place in the treatment of inherited syphilis, though bismuth is growing in favour in certain types of case on account of its ease of administration. C. Morton Smith,¹ of Boston, speaks favourably of

the results of treatment with Arsphenamine during pregnancy, stating, in a careful paper containing an analysis of the pregnancies in 500 families, that the prognosis for the child can be entirely changed. P. H. Sylvester,² also of Boston, has been studying Sulpharsphenamine since 1923, and concludes that in early cases the results are nearly as good as those of neo-arsphenamine, while in later cases sulpharsphenamine is more satisfactory, clearing up the clinical manifestations with no less speed and having an earlier effect on the Wassermann reaction. It has the appreciable advantage of being effective when given by the intramuscular route, and in Sylvester's hands has proved successful in cases previously treated by intravenous injections of neo-arsphenamine without avail. This observer draws attention to the 'critical period' (5 weeks to 2 months) in sufferers from inherited syphilis, maintaining that little benefit is derived from treatment started much before or much after the specified age-period. He advocates a course of twelve weekly doses of 10 to 20 mgrm. per pound body weight in 10 per cent concentration, given intramuscularly. The Wassermann reaction is taken after a month's interval, and if it is negative a similar course of injections of half the strength is given; if positive, a course one and a half times the strength of the first is advised.

An oily suspension of bismuth, containing 0.15 grm. of bismuth hydroxide in 2 c.c. of oil and known as Bismol, has been successfully used by Robert Southby,³ of Melbourne, who claims for it a satisfactory absence of toxic reactions, and maintains that the clinical lesions respond readily to its administration, especially in the florid type of syphilis, though it takes longer than the arsenical preparations to influence the Wassermann reaction.

REFERENCES.—¹*Arch. of Dermatol. and Syph.* xv. No. 5, 527; ²*Jour. Amer. Med. Assoc.* 1926, July 31, 298; ³*Med. Jour. of Australia*, 1927, March 12, 357.

TABES DORSALIS. (See also SYPHILIS OF THE CENTRAL NERVOUS SYSTEM.)

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

DIAGNOSIS.—The fundamental signs and symptoms of this disease are well known, comprising, as they do, reflex pupil rigidity (Argyll Robertson pupil); lymphocytosis of the cerebrospinal fluid; lightning pains; loss of deep reflexes (especially the ankle-jerks and knee-jerks); visceral crises, gastric and others; disorders of micturition; disturbances of sensation; and ataxia of the limbs. The alert physician nowadays should be able to recognize the malady before the onset of ataxia, in the hope of arresting the disease in its early or pre-ataxic stage. Thus we may confidently diagnose early tabes when in addition to the Argyll Robertson pupil there is lymphocytosis of the spinal fluid and loss of one Achilles reflex.

Ivor Davies¹ has recently recorded an interesting series of cases of *irregular or incomplete forms* of tabes, and directs special study to cases of tabetic gastric crises, emphasizing their differentiation from acute abdominal emergencies, such as peritonitis from perforated ulcer, vomiting from acute intestinal obstruction, etc. Patients with tabetic gastric crises generally have an abrupt onset and termination of the attacks. When the tabetic crisis is over, there is usually a rapid recovery of the digestive functions, so that the patient often takes a full meal within an hour of cessation of a severe attack. Whilst the general disturbance as regards pain at the height of a paroxysm resembles that of a common acute abdominal state, it is noteworthy that in the tabetic there is extreme physical restlessness, so that the tabetic patient writhes in agony and rolls about in pain, in sharp contrast with the immobility of the ordinary patient with an 'acute abdomen'. There is also absence of localized tenderness and rigidity, also absence of abdominal distention, the abdomen being usually retracted. The cerebrospinal fluid should invariably be examined in suspected

cases. Confusion with acute abdominal emergencies only arises in earlier attacks. On the other hand, as Purves-Stewart reminds us, ordinary acute abdominal emergencies may occur in tabetic patients and may be painless throughout. The only safeguard is that of careful clinical examination.

Gastric Crises in Tabes.—An interesting and significant point, both about lightning pains and gastric crises in tabes, is that they need not necessarily be regarded as evidence of an advance of the morbid process but must be considered as the reaction of diseased nerve-tissues to some outside stimulus. This is shown by the fact that lightning pains may recur for years in cases of stationary tabes, whereas, in rapidly advancing tabes, lightning pains and gastric crises may be slight or absent. Many cases of severe gastric crises yield completely negative reactions in the cerebrospinal fluid, indicating that the morbid syphilitic process in the spinal meninges is at a standstill. Moreover, clinicians are familiar with the scantiness of other tabetic symptoms in many cases of gastric crises. It may even be that a gastric crisis is the first symptom which calls attention to the existence of a previously unsuspected underlying tabes. It is therefore reasonable to suggest that some permanent tissue change is present, probably in the sensory proto-neurone, which permits of the excitation of lightning pains or gastric crises by stimuli whether of exogenous or endogenous origin.

Förster, of Breslau, in 1909 was the first to attempt Surgical Treatment for gastric crises. The afferent nerves of the stomach reach the spinal cord through the roots of T 6 to T 9, and especially through the 7th and 8th roots. Förster accordingly divided the posterior roots of T 7 to T 10 inclusive, later extending his operation to comprise from T 5 to T 12 inclusive. Several brilliant results were obtained by him, but in other equally promising cases no improvement followed. The explanation may be that the posterior roots are not the sole paths by which visceral afferent stimuli reach the brain-stem. Some afferent fibres run upwards through the anterior roots as well. There are therefore two varieties of crises: in the first the irritation traverses spinal nerves through the posterior roots; in the second it traverses sympathetic nerves and anterior roots. To attack both factors, Gaza² has divided the corresponding rami communicantes of the sympathetic chain, whilst Franke has avulsed the corresponding intercostal nerves, and Sicard and Desmout³ have resected the anterior and posterior roots together with the corresponding posterior root ganglia. A different mode of attack is that of Exner,⁴ who, regarding the vagus as the main path of morbid excitation, divided both vagi beneath the diaphragm in two cases of his own, and claims that, out of 29 patients thus treated by various surgeons, half were cured. It must be confessed, however, that surgical intervention, hitherto, is unreliable in its effects.

Recently, in watching the effects of Malarial Treatment of general paralysis and tabo-paralysis, one is struck by the frequency with which tabetic crises and lightning pains have subsided. It is therefore, as Wagner-Jauregg⁵ reminds us, worth while bearing in mind that we have at our disposal this weapon, which is less risky than surgical operation and can be repeatedly employed if necessary.

REFERENCES.—¹*Lancet*, 1926, ii, 1316; ²*Arch. f. klin. Chir.* 1924, 133; ³*Lyon. Chir.*, 1913; ⁴*Deut. Zeits. f. Chir.* 1911, 111; ⁵*Wien. klin. Woch.* 1926, Sept. 16, 1093.

TALIPES. (*See FOOT, DEFORMITIES OF.*)

TAPE-WORM INFECTION.

Robert Hutchison, M.D., F.R.C.P.

TREATMENT.—T. B. Magath and P. W. Brown¹ describe the following standard method of treating cases of tape-worm at the Mayo Clinic, which they claim has resulted in the recovery of the head in every instance in which the

routine was correctly carried out: First, it is necessary to clear out the gastro-intestinal tract completely for at least twenty-four hours preceding the treatment, and also an attempt should be made to clear the lower bowel of the large food remnants. In particular, fruits of various kinds should be avoided before treatment. Since some patients vomit the drug, it is often preferable to give it by stomach tube. It may be administered in black coffee, but the authors prefer to give it by mouth without coffee, and, if the first dose is not retained, to give another through the stomach tube. All of the stool in its original container is sent to the laboratory for examination. If the following course of treatment is rigidly adhered to, one may expect success in practically every instance.

Preparation of the Patient.—The patient should not have luncheon or supper the day preceding treatment; black coffee or tea and water may be taken freely. At 6 p.m., from 15 to 30 grm. of Magnesium Sulphate is given, and at 6 a.m. the same dose is again administered.

Administration of the Drug.—The patient has no breakfast, and, after the bowels have moved, 30 c.c. of the following emulsion is given: Oleoresin of Aspidium, 6 c.c. or grm.; Powdered Acacia, 8 grm.; distilled water, sufficient to make 60 c.c. One hour later, a second 30 c.c. of emulsion of aspidium is administered; two hours later, 30 grm. of Magnesium Sulphate; two hours after this a large Soap-suds Enema is given. The patient then passes the stool into a container, which is sent, together with the stool passed before the administration of the drug, to the laboratory. He is cautioned not to put toilet paper into the specimen.

Search for the Worm Head.—If the patient has been properly prepared, the stool will consist of practically nothing but water, a few shreds of digested food, and the worm. The top half of the stool, which usually consists of about 2 quarts of water, may be poured off, and the rest of it is poured through a sieve with a 20-mesh bottom. Warm tap-water is now run through the sieve, and if the procedure is properly carried out the sieve will contain nothing but the worm. The contents of the sieve are now emptied into a flat enamel pan measuring about 25 by 30 cm., the bottom of which has been painted black with asphalt paint. The sieve is rinsed out into the pan by running water through the bottom. If each step has been carefully carried out, the finding of the head will be comparatively simple. The large soap-suds enema given at the end of the treatment is extremely important, for often, when the worm is dislodged, the head breaks off and passes into the colon, where it will remain unless swept out by the large enema. It is also essential to use saline purgatives instead of castor oil, as aspidium is highly toxic and soluble in oil.

This method is very much the same as that usually employed in this country. It will be observed that the dose used by the writers is 90 gr. of male fern given in two portions at an interval of one hour. The importance they attach to the administration of a soap-and-water enema after the treatment is worth noting. The present writer has found that a sieve lined with black crêpe facilitates the search for the head and is probably just as useful as the special pan mentioned above.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1927, May 14, 1548.

TARSUS, TUBERCULOSIS OF. (*See TUBERCULOSIS OF BONES AND JOINTS.*)

TENDON TRANSPLANTATION FOR PARALYSIS. (*See PARALYSIS, TENDON TRANSPLANTATION FOR.*)

TESTICLES AND SEMINAL VESICLES, AFFECTIONS OF.

Sir John Thomson-Walker, F.R.C.S.

A number of articles deal with the pathology and treatment of the *imperfectly descended testicle*. In a few the results of operation are stated; in most, slight variations in the operation are noted without any fundamental change in technique.

P. Turner¹ draws attention to the importance of distinguishing between an imperfectly descended testicle and 'spastic retraction of the testicle', which is due to spasm, intermittent or continuous, of the cremaster muscle. In a boy of 19, a normally placed left testicle with a patent processus vaginalis, or 'potential hernia', as the result of an accident, was drawn up into the inguinal canal, and at the same time the bowel was forced into the patent funicular process. A year later secondary contraction of the fasciæ and soft parts had occurred, so that the appearance of a congenital imperfectly descended testicle was produced. H. W. Meyer² states that spermatogenic cells are present and functionate in about 10 per cent of all cases. The interstitial cells which are concerned with the development of the secondary sexual characteristics are always abundantly present. The undescended testicle should therefore be saved. The best time to operate is before puberty, between 8 and 10 years of age. The writer is of opinion that Torek's method of orchidopexy and herniotomy is the best; he describes the technique in detail.

In a series of 537 operations C. G. Burdick and B. L. Coley³ obtained satisfactory results as to the location of the testis in about 50 per cent of cases and as regards the size of the testicle in about 15 per cent. The writers' experience leads them to believe that except in rare instances an atrophic testicle when placed in the scrotum does not continue to develop normally. The operative technique is described in detail.

A. H. Southam and E. R. A. Cooper⁴ describe 50 cases of inguinal retention of the testis treated by operation. In 38 cases one side only was concerned, whilst in 6 both sides were submitted to operation. The ages of the children were between 3 and 14 years, the average age being 7 years. All cases have been carefully followed up, and the time that has elapsed since operation was performed varies from one to five years. In 36 cases a testis of normal size and consistence was found free in the scrotum, whereas in 14 cases the testis became retracted, with or without associated atrophic changes. Associated hernia was present in 46 of the cases and was repaired. The spermatic vessels were divided in 4 cases, and in each of these cases subsequent atrophy of the testis occurred. The writers conclude that good results after operation are not exceptional, and that there is a reasonable prospect that the transplanted testis will acquire the spermatogenic function at puberty provided the organ be placed in the scrotum before morbid changes have occurred. The presence of a living testis in the scrotum in a considerable percentage of cases (72 per cent) justifies the operation. In cases in which there is an imperfectly descended testicle on one side and a well-developed fully descended testicle on the other, C. P. G. Wakeley⁵ considers "the partly descended testicle should be removed unless it can be brought down into the scrotum without any tension or division of any of the constituents of the spermatic cord. In bilateral cases it is advisable to take means to preserve the internal secretion on both sides, and an attempt should be made to bring one testicle into the scrotum in order that some chance of fertility may be afforded the patient, and to return the other testicle into the abdomen". The writer describes his technique in detail. J. S. Eisenstaedt⁶ records the results of operation in 15 cases of 'undescended testis', 4 of which were bilateral. The writer regards the careful division of the many fibrous adhesions around and within the

spermatic cord, together with freeing of the cord at the internal abdominal ring and preservation of the blood-supply of the testis, as essential if a good result is to be obtained.

J. Arce⁷ describes the technique of Ivanissevich's operation for the cure of *varicocele*. The operation is based on the belief that varicocele is the result of disease of the spermatic veins identical with that of the saphena vein in cases of saphena varix affecting the superficial veins of the leg. The spermatic vein is resected in the retroperitoneal part of its course after having left the cord, while it is passing upwards with the artery, which is here easy to isolate and preserve.

M. B. Wesson⁸ reports four cases of *seminoma of the testicle* treated by orchidectomy followed by deep X-ray therapy. A case of sarcoma of the scrotal raphe is also reported. The writer considers that the hydrocele present with a solid tumour of the testicle should never be aspirated, for if the tumour is injured the growth will be stimulated and local transplantation of malignant cells will occur. All swellings of the testicle must be considered as malignant until proved benign, hence exploration is indicated in all doubtful cases.

A. R. Fraser and L. B. Goldschmidt⁹ discuss the surgical management of *seminal vesiculitis* on the basis of a series of 32 cases submitted to operation. The cases were selected from consulting practice in which probably a much greater percentage of old-standing infections is met with than in an ordinary venereal clinic. There were 3 cases of vesiculectomy, in all of which associated urethral obstruction was present, 1 case of vesiculectomy for acute toxæmia with high fever which vasotomy failed to relieve, and 28 cases of vasostomy or vasotomy. The writers are of opinion that whereas "conservative measures in the management of gonococcal vesiculitis still hold a premier place, vasotomy is a surgical procedure which shortens the duration of treatment without serious risk to the patient, and does not carry the tendency to sterility, spermatic fistula, and scrotal nodulation and infiltration which is associated with vasostomy. In cases where direct attack on the vesicles is called for, vesiculectomy holds a distinct preference to vesiculectomy". M. F. Campbell¹⁰ reports 15 cases of *torsion of the spermatic cord*. The most frequent immediate antecedent was sudden muscular effort or violent straining. This was present in 6 of the cases reported in this series.

REFERENCES.—¹*Clinical Jour.* 1927, May 4, 205; ²*Surg. Gynecol. and Obst.* 1927, Jan., 53; ³*Ann. of Surg.* 1926, Dec., 867; ⁴*Lancet*, 1927, i, 805; ⁵*Ibid.* 1926, ii, 245; ⁶*Jour. Amer. Med. Assoc.* 1927, April 30, 1389; ⁷*Surg. Gynecol. and Obst.* 1926, Nov., 687; ⁸*Amer. Jour. Surg.* 1927, March, 243; ⁹*Lancet*, 1926, ii, 751, ¹⁰*Surg. Gynecol. and Obst.* 1927, March, 311.

TETANUS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Tetanus was so common during the War and immediately afterwards, that practitioners sometimes forget that it is a disease of civil practice. It is essential to remember to administer 500 units of Antitetanic Serum as a prophylactic in all potential cases. Legal proceedings might take an awkward turn, from the medical practitioner's point of view, if an injured workman developed tetanus and died without having received a prophylactic dose.

A. P. C. Ashhurst¹ thinks patients recovering from tetanus without receiving antitoxin by the intraspinal route are exceedingly rare. The aim of treatment should be: (1) To prevent the further absorption of toxin by abolishing its source (the infected wound); (2) To neutralize that which is being absorbed by immediate intravenous injection of from 15,000 to 20,000 units of antitoxin; (3) To neutralize that which has already been absorbed into the spinal cord by immediate intraspinal injection of from 6000 to 10,000 units; (4) To administer enough spinal depressants, preferably chloral and bromides, by

mouth or by the rectum, to exert a physiological effect: (5) To keep the patient alive by feeding and nursing.

The reviewer was tetanus inspector in the Irish Command during the War, and he found the old classification of tetanus very reliable from a prognostic point of view in: (1) Hyperacute tetanus, when the signs and symptoms appeared within a few hours after some injury or operative interference; (2) Acute, in which symptoms arise within forty-eight hours; (3) Subacute, when some days elapse before the early signs appeared; (4) Chronic, in which symptoms did not appear until some weeks after the injury. The shorter the incubation period the more fatal the disease. Very few cases which come under the heading of (1) or (2) recover. If prophylactic injections are given, the modification of the disease is profound; not only is the incubation greatly prolonged, but in many cases the manifestations are local. The possibility of the incubation period being prolonged to weeks or even months by prophylaxis may lead to a mistaken diagnosis when signs of the disease appear. In the curative treatment of tetanus, 8000 units should be injected intramuscularly on the first day, and 16,000 units introduced into the spinal canal. The same dosage by both methods is repeated on the second day, and on the third and fourth day half the amount is administered, 4000 by the intramuscular route and 8000 by the intrathecal; on the fifth, seventh, and ninth day, 2000 units are introduced subcutaneously.

S. O. Freedlander² discusses the use of antitoxin intravenously. He also draws attention to the inverse relation of the incubation period to the mortality-rate. Within the first twenty-four hours 100,000 units of antitoxin are given intravenously, divided into three to five injections; thereafter daily doses of 15,000 to 150,000 units intravenously in from two to three injections. The rationale of the treatment depends upon the fact that tetanus toxin appears early in the blood-stream, and it is from here that it is taken up by the motor nerve-endings. The gross mortality in Freedlander's cases was 36 per cent. The author urges that the relatively low mortality-rate in this series of 25 consecutive cases points to the fact that tetanus antitoxin given in large doses intravenously has some therapeutic value. Leishman³ agreed with the Tetanus Committee, of which the present reviewer was a member during the War, that the intravenous route should not be used. The risk of anaphylaxis is great. Dean⁴ favoured intravenous injections as described by Freedlander.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1926, Dec. 18, 2089; ²*Ann. of Surg.* 1927, March, 405; ³*Lancet*, 1917, i, 131; ⁴*Ibid.* 673.

THECAL PUNCTURE: THERAPEUTIC INDICATIONS.

Sir James Purves-Stewart, K.C.M.G., C.B., F.R.C.P.

For many years it has been recognized that withdrawal of cerebrospinal fluid is indicated in all forms of meningitis, both for removal of infected fluid from the subarachnoid space, and, in certain forms of meningitis, for the purpose of introducing curative sera, e.g., anti-meningococcal serum, anti-poliomyelitic serum, salvarsanized serum, etc. For the mere withdrawal of cerebrospinal fluid, the lumbar route will usually be found the more convenient.

In some cases, however, the cisternal or suboccipital route, despite the greater technical skill demanded, will be the method of choice, especially when we desire to introduce our remedies as directly as possible into the cerebral subarachnoid space. Further, cisternal puncture is called for when we desire to introduce heavy lipiodol above the level of a spinal compression so as to recognize by radiography the precise level of the obstruction.

Lastly, filling of the cerebral ventricles with air in selected cases, and following it up by ventriculography, is attained either by the lumbar route, in which

60 or 70 c.c. of air are required to fill the ventricles, or by the cisternal method, where about 30 c.c. are usually sufficient to achieve the same result.

Cisternal puncture, however, is not devoid of risk. In careless or inexperienced hands the brain-stem may be struck, with fatal results; or perimedullary hæmorrhage may occur from damage to the vessels, especially if there be meningeal adhesions near the site of puncture.

Both lumbar and cisternal puncture should be scrupulously avoided in cases of suspected tumour of the posterior fossa, lest the withdrawal of fluid may induce sudden prolapse of part of the cerebellum downwards through the foramen magnum, constituting a pressure-cone, with fatal compression of the medulla.

Amongst the therapeutic indications for lumbar puncture we may mention cases of *uræmic* coma and convulsions, in which purgative and diaphoretic drugs, even supplemented by free venesection, have failed. Such patients can sometimes be rescued by timely lumbar puncture, causing a dilution of the uræmic toxin in the cerebrospinal fluid. Another indication for lumbar puncture is in the curious acute syphilitic meningitis which sometimes supervenes during the intensive treatment of syphilis by means of salvarsan. This so-called *Herzheimer's reaction* is apparently due to the sudden liberation into the cerebrospinal fluid of large quantities of endotoxin produced by the slaying of the spirochaetes by the salvarsan. Prompt lumbar puncture, together with redoubling of the antisyphilitic measures, will usually relieve these alarming cases.

In *epidemic encephalitis*, especially in early cases with stupor or coma, and in those with radicular pains, withdrawal of cerebrospinal fluid is often useful, and even in the subacute stages of the malady it has a beneficial effect.

There are also various exogenous *poisons* in which withdrawal of cerebrospinal fluid is of vital importance. In two cases of acute *veronal poisoning*, where the patient was comatose and apparently moribund, I have withdrawn fluid by cisternal puncture and the patient recovered. Veronal was subsequently demonstrated in large amount in the withdrawn fluid. Poisoning by *methyl alcohol* (wood alcohol) is commoner in the United States than elsewhere. It is often associated with acute blindness from toxic affection of the optic nerves, supervening within a few hours after consuming the methylated spirit. This blindness may be a permanent affair, unless the toxic cerebrospinal fluid is promptly withdrawn by repeated punctures, as in three successful cases recorded by Triebenstein.¹ It is noteworthy that in these cases there is not necessarily any increase of intracranial pressure: on the contrary, the fluid may prove to be subnormal in pressure. This points to an accumulation of toxic fluid in the subarachnoid space, a condition which is directly relieved by lumbar puncture. Methyl alcohol appears to be more slowly excreted from the cerebrospinal fluid than is ordinary ethyl alcohol, and thus tends to have a cumulative effect on the central nervous tissues. Curschmann² also recommends lumbar puncture in cases of *acute ethylic alcohol poisoning*, where the patient is comatose with loss of deep reflexes and with respiratory embarrassment. He also suggests it in cases of *acute lead poisoning*, e.g., in the variety which sometimes follows operations for the removal of leaden bullets, in which the patient tends to die acutely with coma, convulsions, acute palsies, and spastic phenomena.

REFERENCES.—¹*Dissertation*, Rostock, ref. in *Munch. med. Woch.* 1926, Aug. 6, 1409; ²*Ibid.* 1407.

THORACIC SURGERY. (See CHEST, SURGERY OF; X-RAY DIAGNOSIS.)

THROMBO-ANGIITIS OBLITERANS.*A. G. Gibson, M.D., F.R.C.P.*

J. E. Harbinson¹ reviews the non-operative methods of treatment of thrombo-angiitis obliterans that may prove useful. He refers to rest in bed; position of the limb, the best position being that in which the limb has the most natural colour—alterations in position giving first venous stasis and then a return to normal by elevating the limb have been advocated by Buerger; diet, an increase of fluid intake; thermotherapy; helio and electric therapy; massage. Meyer was the first to report benefit from intravenous injections of **Sodium Citrate**, 250 cm. of a 2 per cent solution every other day for a month, followed by a gradually increasing dose interval. A great variety of drugs have been used. Iodides should always be given as a routine to promote healing; **Mercury** should be used in any case with a possibility of syphilis. **Salvarsan** is advocated by the French. Peri-arterial sympathectomy is disappointing. **X-ray Therapy** in some hands has given good results. The very multitude of remedies is a testimony to the difficulty of giving adequate relief in this distressing complaint, short of operation.

For non-diabetic arteritis of the type of intermittent claudication and non-syphilitic, H. Vaquez and J. Yacôl² have given with success in four cases regular courses of **Insulin** injected before the two principal meals as in diabetics, adding to the meal a sufficiency of carbohydrates to avoid hypoglycæmia. The dose has been from 5 to 10 units twice daily, and after a course of twenty days the treatment is interrupted, to begin again after an interval. Under treatment the pains became less and finally ceased; the circulation in the affected parts improved. The authors are careful to note that this treatment cannot be of service when gangrene requires surgical interference.

SURGICAL TREATMENT.—The conditions resulting from arterial lesions and anomalies of function are often most resistive to treatment; this applies especially to thrombo-angiitis obliterans, endarteritis obliterans with or without thrombosis, and Raynaud's disease. Thrombo-angiitis obliterans does not as a rule show marked changes in the vascular arterial coats—it is mainly a thrombosis of increasing extension. G. E. Brown³ examines various methods of treatment and attempts to assess the limits of their various uses. The author has found that in cases where the extra possible vascular supply to the limb is adequate, the removal of the 2nd, 3rd, and 4th lumbar sympathetic ganglia, shown by Adson in cases of spastic paraplegia to cause striking vascular dilatation, had also a striking effect in the relief of symptoms of arterial lesions. Good results have been obtained in three cases of Raynaud's disease; the pulses returned in the distal arteries, there was no hyperæsthesia or tenderness, and no recurrence of symptoms was noticed at least up to one year. In erythromelalgia this treatment is disappointing. In thrombo-angiitis the relief of pain and the corresponding general benefit were striking in all five patients operated upon. In the selection of suitable cases for operation Brown lays stress on the determination of the capacity of the limb to undergo vascular dilatation, and he uses as a test a sufficient dose of antityphoid vaccine to cause a rise of temperature of 1 to 2° C., and estimates by means of a surface electric thermometer the amount of increase in the superficial temperature. The author remarks that obviously gangrenous limbs should be amputated if the patient's condition permits, and that in mild cases the medical measures of most use are **Protein Shock** and irradiation of the sacral spine with **X Rays**.

Sir W. I. de C. Wheeler⁴ discusses the reasons for operation and the types of operation in thrombo-angiitis obliterans, and reports two cases in which this was necessary.

REFERENCES.—¹*Therap. Gazette*, 1927, Feb., 96; ²*Presse méd.* 1927, May 18, 625; ³*Jour. Amer. Med. Assoc.* 1927, Aug. 7, 397; ⁴*Brit. Med. Jour.* 1927, 1, 225.

THUMB, PARALYSIS OF. (*See PARALYSIS OF THE THUMB.*)**THYROID GLAND.** (*See also GOITRE; MYXŒDEMA.*)**THYROID GLAND, SURGERY OF.** *Sir W. I. de C. Wheeler, F.R.C.S.I.*

Exophthalmic Goitre: Toxic Adenoma.—There is still a flood of literature in connection with the treatment of exophthalmic goitre. The treatment resolves itself into medical and surgical. Medical treatment consists fundamentally of absolute Rest, Radiotherapy by an experienced radiologist, and the administration of sedative drugs such as Quinine Bromide. In a sense, surgical treatment is seldom undertaken without preliminary preparation of the patient by medical means. Successful medical treatment of Graves' disease depends upon the thoroughness with which it is carried out.

A. S. Jackson¹ deals with the question of primary Thyroidectomy for exophthalmic goitre. He states that patients are now coming for operation before chronic myocarditis and chronic nephritis have occurred; thus, the surgeon must acknowledge the assistance he has received as a result of the quickened diagnostic sense of the physician. Jackson rightly points out that the efficacy of Iodine as an aid to surgery has revolutionized the treatment of exophthalmic goitre. The dreaded post-operative hyperthyroid reaction has disappeared, and multiple-stage operations have been discarded. In addition to iodine he recommends as part of the pre-operative treatment the administration of 1½ gr. of Luminal daily to quiet the nervous system. Ten drops of Lugol's Solution are given before meals and at bedtime. Preparation is seldom longer than two weeks. Jackson also recommends the use of Digitalis before operation, and in this matter differs from some of the workers in the Mayo clinics. Morphine-Scopolamine-Novocain Anæsthesia is recommended, and as much of the gland as possible is removed. The reviewer strongly recommends colonic ether with local infiltration of novocain as the anæsthetic of choice in these cases. After operation, the administration of iodine—one drop to a teaspoonful of water—is started at once. Later 10 drops are given every half-hour for six doses, and 4 drops thereafter until the following morning. Each day the dosage is decreased 10 drops. Tracheitis is mentioned by Jackson as a complication. The reviewer found this very troublesome in some cases, especially when free division of the tracheal muscles was necessary at operation. If, in addition, the laryngeal nerves are pulled upon, alarming dyspnoea may arise.

W. Bartlett² refers to the *patient unsuited to thyroidectomy*. *Inter alia* he states that blood-pressure definitely lowered from a known high level should always warn the operator of myocardiac insufficiency. Great loss of weight is an absolute contra-indication to operation. Absence of self-control is a contra-indication. Most important of all as a contra-indication is definite heart injury. He divides the cases into three classes: those who are temporarily, indefinitely, or permanently unsuited to operation. Bartlett believes that numbers of such cases can be improved and got ready for operation. Five classes of patients appear particularly unsuited to thyroidectomy: the fulminating, the adolescent, the insane, those with epilepsy, and pregnant women.

F. de Quervain and G. M. Curtis³ express their belief that preliminary iodine treatment in toxic adenoma is dangerous. The majority of toxic adenomata under their care arose subsequent to the iodine treatment of an ordinary goitre. E. P. Richardson⁴ also discusses the value of iodine in the surgical treatment of exophthalmic goitre. Those who have used Lugol's solution extensively are familiar with the case which does not benefit, and the reviewer has seen one case in which the symptoms were aggravated although the dose of the

Lugol's solution was varied several times. Richardson says that somewhat less than half the cases show a marked remission; another third show definite improvement, while in the remainder the effect is slight or absent. He does not agree that any cases are made worse during the short period of treatment recommended. The improvement produced by the iodine is only temporary. If the drug is continued, the pulse and metabolism gradually rise and the symptoms of the disease increase again. Even if the use of iodine is kept up for many months the disease remains active, although there may be gain in weight and improvement of general condition. If the iodine is omitted, the symptoms rapidly recrudescence, and the patient may be worse off than before the iodine was given. It is quite clear that the use of iodine is not a satisfactory medical treatment for exophthalmic goitre. Its main use is to create a favourable opportunity for operation. When iodine has once been given, the effect of its withdrawal cannot be predicted and serious toxicity may develop. Richardson recommends 15 to 30 min. of Lugol's solution daily; operation to be undertaken when the maximum iodine effect is believed to be obtained. Iodine does not convert patients with exophthalmic goitre into normal operative risks. He thinks it is still necessary to judge carefully the seriousness of the individual case, and to divide the operation when necessary into two or more stages. He recommends 60 min. of Lugol's solution by the rectum, in tap-water, during the first twenty-four hours after operation, and to continue with 30 min. daily by mouth until discharge.

Tuberculosis of the Thyroid Gland.—This is a rare condition, many of the older pathologists holding that the thyroid gland was never invaded by tuberculosis. During the last twenty-five years, however, a number of cases have been put on record. In some cases the gland is studded with tubercles which can be seen with the unaided eye; usually the tubercles are microscopic, but this is the more acute type. In other cases there may be caseation and the formation of cold abscess. The other tissues of the neck become involved, and the thyroid gland is as a rule fixed in position. There are other pathological variations. F. A. Collier and C. B. Huggins⁵ review the literature and give a record of five cases.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1927, March, 406; ²*Jour. Amer. Med. Assoc.* 1926, Oct. 16, 1279; ³*Surg. Gynecol. and Obst.* 1926, Oct., 498; ⁴*Boston Med. and Surg. Jour.* 1926, June 10, 1066; ⁵*Ann. of Surg.* 1926, Dec., 804.

TIC DOULOUREUX. (See NEURALGIA, TRIGEMINAL.)

TONSILS, DISEASES OF.

A. J. M. Wright, M.B., F.R.C.S.

Tonsils and Systemic Disease.—

Rheumatism.—For years evidence has been accumulating that the infection in cases of rheumatism and endocarditis in children may enter the system by the tonsil. The British Medical Association has published the results of an investigation into the etiology, etc., of rheumatic heart disease in children. One section of this report deals with the effect of tonsillectomy on rheumatic infections in children.

For this purpose the rheumatic symptoms occurring in 45 tonsillectomized children for periods of one to five years have been analysed by Reginald Miller¹ and compared with the symptoms in the same children before operation. As a control, the symptoms of 133 children with tonsils were also tabulated. Analysis of these cases produces evidence strongly in favour of the value of tonsillectomy. Sore throats, arthritis, and carditis in all of its forms, are found to be greatly diminished by the operation. Muscular pain gradually disappears. Chorea, on the other hand, appears to be totally uncontrolled,

but it seems to be probable that operation tends to prevent the heart from being affected. Early operation is advisable, and possibly the relative rarity of severe rheumatism among the well-to-do is due to the earlier date at which the tonsils tend to be removed. The operation does not seem to produce any ill-results on the disease.

Reidar Gording and Hakon Bjorn-Hansen² have considered that while some cases of polyarthritis are infective in origin, others are 'constitutional' (whatever that may mean). As a guide in deciding in which cases one should aim at removing a source of infection, i.e., the tonsils, they have carried out a series of blood examinations. Of 25 cases of polyarthritis, 6 showed the characteristic blood picture of an infection. It is possible that some such examination may be helpful in deciding whether we are dealing with the results of a past infection or with one which is still active.

Nephritis.—A very similar state of affairs exists in regard to the tonsils and this disease. Wichert³ gives the results of the removal of tonsils in 27 cases of chronic nephritis. Of these, 9 were cured and 4 improved. He is strongly of the opinion that, in the absence of some important contra-indication, the tonsils should be removed in all cases of chronic nephritis. He does not consider that the appearance of the tonsil or the history is any guide as to the advisability of operation. He points out that, by adopting this operation, success will be achieved in more than half the cases, and that this result cannot be obtained by any other method of treatment.

Acute Adenoiditis.—While acute inflammation of the pharyngeal tonsil is a commonplace, a similar inflammatory condition affecting the nasopharyngeal tonsil is no doubt frequent, but, from the difficulties of examination, it is not recognized. Moure¹ states that it can be recognized by the fever, respiratory obstruction, and cervical adenitis. In addition to general measures and a careful watch on the ears, he advises the following drops to be instilled into the nostrils three or four times a day:—

R Adrenalin.	℥v	Ol. Cajuput.	℥j
Chloretone	gr. j	Paraff. Lq.	ʒss

Peritonsillar Abscess.—Gordon Hoople⁵ has evolved a simple method of local anæsthesia for use in the opening of a peritonsillar abscess or quinsy. The method depends on the fact that the sensory supply of the soft palate and tonsils is largely derived from the palatine nerves which descend from the sphenopalatine ganglion. He has found that, by a preliminary cocaineization of this ganglion, the patient is enabled to open the mouth more freely, and the incision, when made, is much less painful. The method simply consists in applying a pledget of cotton-wool dipped in 10 per cent or 20 per cent cocaine solution in the region of the ganglion, and leaving it there for at least ten minutes.

Diathermy and Radiotherapy.—The use of diathermy as an alternative to surgical removal of the tonsils was referred to in the MEDICAL ANNUAL for 1924, p. 466. G. A. Dillinger,⁶ in dealing with this subject, states that the detail of technique is of great importance, and that the method has been condemned simply because a correct technique has not been employed. He has used diathermy for the removal of tonsils in 150 cases, and states that he has never had any ill-results of any sort. The method would seem to be worth trying in cases in which operation is contra-indicated. The main points in technique are as follows: A local anæsthetic is employed, consisting of a painting of the tonsils, soft palate, and base of the tongue. The application is made with a cotton-wool mop, moistened with 5 drops of 10 per cent cocaine, this one mop being applied several times without any more cocaine

being added. In ten minutes the anæsthesia is adequate. A metal electrode consisting of a piece of block tin, 6 in. \times 10 in., is applied over the patient's back. The needle electrode is inserted into the tonsils to a depth of from $\frac{1}{8}$ in. to $\frac{1}{4}$ in., and a current of 2500 ma. is allowed to pass for from one to two seconds, i.e., until a white ring of coagulation is seen to take place around the needle. Only one tonsil is treated at a time, and multiple punctures are made at intervals of about $\frac{1}{4}$ in., the total number being sometimes as many as 15. The tonsils are treated alternately at intervals of eight days, and two or three applications are usually necessary to each side.

E. Gonzalez⁷ advocates the use of X Rays, Radium, and Diathermy in the treatment of these cases. He considers that the advantage of radiation is that it will deal with infections of the pharynx as a whole, which removal of the tonsils will not. Coleman Scal⁸ has treated twelve cases by the insertion of removable Platinum Radon Seeds, following Muir's technique. The method employed is as follows: A single seed is inserted into each tonsil and is removed at the end of four days. As the pain is trivial, no anæsthetic is necessary and no sloughing is produced. The seeds are inserted through a special trocar or 'implanter'. The implanter is so arranged that the seed is inserted at a standard depth of 1 cm. and it is placed as far as possible in the centre of the tonsil to be radiated. The dose used is a 2.8 millicurie platinum radon seed. The advantages of the method are stated to be its extreme accuracy, that only one application is necessary, and that by means of the attached thread the seed can be easily removed. Also no anæsthetic is necessary and shock is absent.

REFERENCES.—¹*Brit. Med. Jour. Suppl.* 1926, July 3; ²*Acta Oto-Laryngol.* viii, fasc. 1-2; ³*Munch. med. Woch.* 1926, No. 46; ⁴*Jour. des Prat.* 1926, Oct. 2, 665; ⁵*Laryngoscope*, 1926, August, 577; ⁶*Med. Jour. and Record*, 1927, May 18, 659; ⁷*Rev. Espan. y Americana de Laringol. Otol. y Rinol.* 1925, July, xvi, No. 4, 209; ⁸*Med. Jour. and Record*, 1926, Dec. 1, 673.

TOXÆMIA OF PREGNANCY. (See ANTE-NATAL CARE.)

TRACHEOTOMY.

A. J. M. Wright, M.B., F.R.C.S.

'It is an interesting observation that tracheotomy, though an established operation of surgery for over 2000 years, is often performed with reluctance, is frequently delayed until its execution becomes difficult or even useless, and, in its performance, is not uncommonly imperfect or unsatisfactory.' With this opening remark of StClair Thomson¹ there will be general agreement. The subject of his article is to establish indications for the operation, particularly from the point of view that it is not performed as often as it should be. The chief reason given for the limitation of tracheotomy is that it delivers direct to the lungs air which has not been filtered, warmed, or moistened. Nasal respiration in childhood is of great importance, but in the adult it is a common observation that an extreme degree of nasal stenosis can exist without any obvious detrimental effect on the individual as a whole. Thus, permanent tracheotomy in the child does seem to carry increased risks of respiratory catarrh, but in adults this seems to be the case only to a very small degree. A well-planned tracheotomy allows of speech, is not obvious, and the only serious social disadvantage is that the individual cannot enter the water. A case has been recorded of a tracheotomy tube having been worn for 70 years by a woman who had seven children and never had bronchitis. Other cases of over 50 years are known. One essential for a permanent tracheotomy is that it should be performed as low as possible in the neck and always below the first three tracheal rings. In this situation a cannula is easily concealed, does not interfere with the movements of the neck or larynx, does not damage

or irritate the larynx, and never sets up perichondritis. If a high tracheotomy has been performed, and prolonged or permanent wearing of the tube is necessary, a low tracheotomy should be substituted at the earliest possible moment. The small disability which a permanent tracheotomy entails makes it the method of choice in many cases of laryngeal stenosis. Unfortunately, however, further damage is frequently done by attempts at removal of the stenosis by extensive and frequently repeated surgical operations. Examples of such cases here given consisted of: (1) Complete bilateral laryngeal paralysis; (2) Stenosis from surgical trauma; (3) Syphilis; (4) Lupus; (5) Tuberculosis; (6) Any trauma of larynx; (7) Epithelioma of larynx.

REFERENCE.—¹*Med. Press and Circ.* 1927, June 8, 462.

TRACHOMA. (See CONJUNCTIVA, DISEASES OF.)

TRYPANOSOMIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Progress in the elucidation of the difficult problems of trypanosomiasis continues to be slow. W. H. Andrews,¹ in opening a discussion at the Royal Society of Medicine on the disease in man and in animals, spoke of the difficulty in classifying pathogenic trypanosomes by their morphology, and the danger of the introduction of variable biological characters into the scheme. Infection of cattle without suffering might be followed by serious outbreaks of disease among them due to the same trypanosome. Further observations were needed on the difference between mechanical and cyclical transmission and their effects on virulence. Infected animals were frequently introduced from Zululand into Natal, but the disease was never spread in the latter area. Although there were differences of opinion on the matter, he thought destruction of game outside certain large reserves should be tried as a prophylactic measure. J. G. Thomson and A. Robertson² have recorded extensive experiments on the variations in the virulence of certain laboratory strains of trypanosomes, and the time they took to kill rats, but all three followed a similar curve. Some of their observations supported the well-known views of Duke. R. G. Archibald³ has described the physical characters of a tsetse fly in the Nubia Mountain province of the Sudan, which is the most northerly region of this area to harbour the *Glossina morsitans*. No cases of human trypanosomiasis were found.

TREATMENT.—G. Maclean⁴ has described a sudden acute outbreak of sleeping sickness due to *T. rhodesiense* in the Ufipa district of Tanganyika Territory, which resulted in the infection of 62 of 663 people living there, or 11 per cent, while in one settlement the incidence was 35 per cent. Of 27 cases treated with Bayer 205, 14 survived and 8 of them remained well, 7 of whom were early cases of not over one month's duration when the treatment was commenced. Two cases which relapsed, recovered again on Tryparsamide. Only 6 of the 12 cases that died after Bayer 205 treatment had the full course of three to four or more injections. Albuminuria was a frequent sequel, but was not usually serious.

REFERENCES.—¹*Lancet*, 1927, i, 132; ²*Jour. Trop. Med. and Hyg.* 1926, Dec. 15, 403; ³*Ann. Trop. Med. and Parasitol.* 1927, March, 39; ⁴*Ibid.* 1926, Dec., 329.

TUBERCULOSIS, ABDOMINAL

A. Rendle Short, M.D., F.R.C.S.

A discussion took place on this subject at the Royal Society of Medicine in January, 1927,¹ opened by Carson. He pointed out that the condition is not so frequent as it used to be, probably on account of better care of children's feeding and milk-supply. There are four forms: tuberculous peritonitis; ileocaecal tuberculosis, either taking the hyperplastic form or tuberculous enteritis occurring generally in phthisics; tuberculous appendicitis (rare):

and mesenteric glands. The last are common in children, and are responsible for many cases of short sharp spasms of pain in the belly, sometimes with vomiting. There is fever only if they suppurate. The great majority of his patients were relieved of their pains by removing the glands. Zachary Cope pointed out that these glands may form a palpable tumour, and they may show in a skiagram if calcareous. Ryle said that children with tuberculous mesenteric glands often went to the physician, not for pain but for tiredness (a very suggestive symptom), some persistent slight nocturnal temperature, best taken in the rectum, and a slight but very chronic diarrhoea.

REFERENCE.—¹*Lancet*, 1927, i, 180.

TUBERCULOSIS, ABDOMINAL, IN CHILDREN.

John Fraser, Ch.M., F.R.C.S.Ed.

R. R. Kerr,¹ at the Manchester Medico-Chirurgical and Obstetric Society, gave an account of the etiology and pathology of this condition which follows the usually accepted lines. Treatment is the question around which debate has chiefly centred. He believes that operation is contra-indicated in what one might term the extremes of the disease—in the early stages, when suspicion is greater than certainty, and in the cases where malaise, progressive wasting, evening rise of temperature, sickness, constipation, abdominal distention, and discomfort, with palpable multiple tumours, put the diagnosis beyond question. Operation, on the other hand, is indicated in the ascites type, when the abdomen is explored, the fluid released, and the appendix removed. Operation is also advisable in the multiple suppurative form, though here the risk of secondary fistulous formation is incurred. In the fibrous type of tuberculous peritonitis, operation was considered to be contra-indicated, though the speaker recounted a remarkable recovery following laparotomy in such a case.

REFERENCE.—¹*Lancet*, 1926, ii, 13.

TUBERCULOSIS OF BONES AND JOINTS. (See also SPINE, TUBERCULOSIS OF.)

John Fraser, Ch.M., F.R.C.S.Ed.

During the past year the study of surgical tuberculosis has claimed increasing attention, and the period has seen the presentation of some original and highly interesting considerations of the disease. It is in connection with bone and joint tuberculosis that particular interest has been aroused, and it is largely to our French colleagues that we owe the stimulus. Robertson Lavallée¹ is Professor of Surgery in Buenos Aires—his name would indicate that he is a representative of the old alliance, for Scotland and France are both represented in the name which he bears. He has presented an appreciation of the pathology of bone and joint tuberculosis which has the fascination of originality. His theories have been brought into line with practical work, and the result has been the publication of certain papers which are startling in their claims. Quoting the Professor's words, as reported in the *Bulletins et Mémoires de la Société Nationale de Chirurgie*: "I have operated on more than 80 patients, with 100 per cent of cures, whatever may be the age, the form, the degree of the tuberculous osteo-arthritis; in many cases sinuses and large cold abscesses already existed". Moreover, it is claimed that this transformation was secured in many cases within a month or two after the operation had been performed. Could anything be more arresting in its claim? Doctor Mouchet, who took part in one of the discussions relating to the communication, spoke of the event as a miracle, and if the claims are established the description will be an apt one.

The principles of Lavallée's views were first published in the *Annals of the Faculty of Medicine of Montevideo* in 1919, and again in 1924 in the *Revue*

d'Orthopédie. In 1926 a monograph on the subject was published in Buenos Aires. The principal French publication is that already quoted. The supposition upon which Lavalley's work is based is as follows. He believes that when a joint with its related bones becomes the site of a tuberculous process, certain highly significant changes appear in the epiphysis; the arterioles tend to be occluded, the veins, particularly at their point of exit from the bone, are partially obstructed, with the result that the nutrition of the related epiphyses is adversely affected. The change is likened to that which occurs in an incomplete obstruction of a loop of intestine, a process, in fact, of subacute venous congestion. It is claimed that a medium so altered favours the development of the tuberculous process, or at least is incapable of making a regenerative effort to overcome the disease. It is suggested that this conception of the pathology arose from witnessing the dark and imperfectly oxygenated blood which escaped from an infected epiphysis when incision was made into it.

Professor Lavalley counters the condition which he believes to exist by inserting a series of **Bone-grafts** into the affected epiphysis. The grafts, cut from the opposite tibia, are each about the thickness of a tooth-pick (*cure-dent*); they are osseous rather than osteoperiosteal, and they are arranged so that they enter the bone through the metaphysis in the long axis of the part, perforate the epiphysal cartilage, and enter the epiphysis. In the case of the knee, for example, two grafts enter the lower femoral epiphysis from the medial and lateral sides respectively, and similarly with the upper epiphysis of the tibia. The length of the grafts is so arranged that they project slightly beyond the bone, and the free ends are connected on the lateral and medial sides respectively by another graft similar in size and osteoperiosteal in type (*Fig. 86*). This external graft is in contact with the osseous portions, but is not secured to them in any way.

The after-treatment is distinguished by its extreme simplicity. After closure of the wounds a simple dressing is applied, and, if there is any degree of flexion deformity, light traction is used. On the twenty-fifth day the child is sent home without splintage; walking, short of fatigue, is recommended, school is permitted—in fact the advice is given that a normal life may be resumed. What advantages are claimed from a procedure which to the average mind must appear so unorthodox? The Professor believes that the grafts institute a continuous drainage of the congested area, permit the entrance of granulation tissue along the bony scaffold of the graft, and so stimulate the resistance to the disease. Moreover, the existence of the healthy grafted bone within the degenerated epiphysis stimulates the production of a vigorous and healthy bone formation. The idea underlying the recommendation of an early resumption of ordinary life is the stimulus of vascularity afforded by free movements and exercise.

The details of technique vary in different localities, but the general principles remain the same. The method has been applied to all the larger joints, to tuberculous disease of the spinal column, and even to tuberculous cavities in the lungs. The results as described are nothing short of dramatic. Lavalley

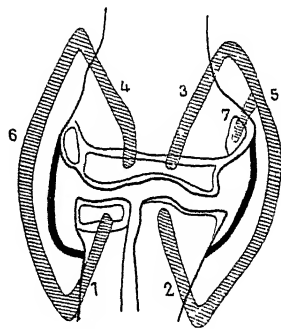


Fig. 86.—Diagrammatic representation of Professor Lavalley's method of epiphysal drainage: 1, Graft to upper epiphysis of ulna. 2, Graft to upper end of radius. 3, 4, Grafts to lower epiphysis of humerus; 5, 6, External connecting grafts, 7, Graft to epiphysis of external epicondyle (*Reproduced from the 'Bulletin et Mémoires de la Société nationale de Chirurgie'.*)

submitted the results of 20 cases for the consideration of the Society, and summaries of the case histories are given in the *Proceedings*. The clinical material is grouped as follows: hip disease 9 cases, knee disease 4, ankle-joint disease 2, elbow-joint disease 1, Pott's disease 4. The reported results are most striking in their excellence. On an average, within one month and a half after the operation, the patient is reported as walking free from pain and with comparatively little evidence of the former disturbance. Such is the procedure and its results; it is evident how revolutionary is the project, and how far reaching must be the consequences if Lavalley's results are confirmed.

In communicating Lavalley's paper, Ombrédanne mentioned that Mouchet, Vignard, and Putti were testing the value of the method, while he himself was able to report four cases in which Lavalley's operation had been practised. The cases were all examples of knee tuberculosis, and the technique was rigidly adapted to that practised by Lavalley. The first case was reported as cured after nine months, complete ankylosis ensuing. The second showed clinical cure at the end of ten months, but during this interval plaster fixation was necessary over a certain period of time. The third case was classed as cured in seven months, but ankylosis was complete. The fourth, operated on in April, 1926, was reported six months later as showing progressive flexion of the knee, and plaster application was required during the period succeeding operation.

In view of the fact that the retention of a certain measure of movement in the joint is one of the most impressive points in Lavalley's results, Ombrédanne's reports can scarcely be accepted as confirmatory, and further, the sequence of events following operation is not materially different from that of many cases in which no special operative procedure has been adopted.

Vignard,² of Lyons, has published his appreciation of and experience with Lavalley's method, and his remarks are of peculiar interest, because the author has long advocated certain principles of treatment somewhat similar to those adumbrated by the Professor. He tabulates the results which Lavalley claimed in a series of 16 cases, 9 being examples of knee disease and 7 of hip disease. From this standard he passes on to a measure of criticism, a criticism which is querulous of certain of Lavalley's theories and facts—and in support of the doubt recalls the results which Ombrédanne obtained, and recites the disaster attending two cases operated on by Lavalley himself in Mouchet's clinic.

Vignard then describes the results of a series of 7 cases of knee-joint disease operated on by a method in some ways comparable to that described by Lavalley. In 4 of these the synovial membrane was excised and grafts of bone (rib) were introduced into the epiphyses transversely, the graft free ends protruding for a few centimetres into the soft tissues around, and being bent or fractured so as to lie among the soft parts in the line of the limb. In 3 cases synovectomy was omitted. The aim of Vignard's procedure was to remove the synovial infection when this was well established, and at the same time to encourage a healthy ossification of the epiphyses by the grafts, the purpose of implanting the free ends of the grafts into the soft tissues being to encourage the entrance of blood-vessels from the periphery.

In the 4 cases treated according to the combined method, the results were 2 cures with relatively good movement, 1 cure with ankylosis in slight flexion, 1 relapse. Of the group—3 in number—treated by grafting without synovectomy, 2 were cured with complete ankylosis resulting; the third failed to respond to treatment. A series of 6 cases of hip-joint disease treated on the same plan showed very similar results. Vignard makes it clear that, in addition to introducing the graft, any evident focus of disease in the bone is first removed by the curette.

These various records are of supreme interest. Only time and experiment can show their value; but one fact emerges which strikes an original note and is therefore particularly welcome—the attempt to establish a healthy calcification and ossification in the affected bone. Lavalley's arguments in connection with the relief of congestion and improved oxygenation of the tissue are scarcely convincing. For one thing they are in direct conflict with the accepted benefits in the treatment of tuberculosis by the method of venous congestion, and it is difficult to see how any degree of intra-osseous drainage is secured through the medium of a penetrating bone-graft. But the idea of regenerating the epiphysal medulla has attractive possibilities. Rarefaction of the bony tissue approximating to a tuberculous focus is one of the most striking evidences of the pathology, and, recognizing that the cure of tuberculosis must ultimately depend upon the resistive action of the body tissues, a strengthening of the stimulus must prove a valuable correction. It is on these lines that the work outlined above is so peculiarly interesting and suggestive.

Russell H. Hibbs and Alan F. Smith,³ of New York, have some interesting things to say about joint tuberculosis. The introductory sentence is arresting: "There is perhaps no other class of surgical cases in which the diagnosis is so often faulty, and in which the treatment is so archaic and ineffectual, as in that of joint tuberculosis". We cannot concur in the justice of this criticism so far as Great Britain is concerned. Enormous improvement, in respect of treatment particularly, has been achieved, and, while we have a long way to travel before our difficulties are overcome, joint tuberculosis has been lifted out of the slough of despond in which it so long lay. We need not, however, take umbrage, for the criticism will help to remind us of the responsibilities and difficulties of this department of our work.

One of the most interesting points of this paper is the view which it expresses upon the site of origin of the disease. After expressing the common view that the disease in practically all cases starts in the *bone* in the region of the joint and involves the latter only secondarily, and after quoting papers by Nichols (1896) and Allison (1920), the authors recount their experience with 20 cases of early disease investigated by operation; in 17 of these the disease unquestionably began in the synovial membrane, and in 3 the bone was primarily involved. These findings have convinced the authors that in "the knee-joint at least the majority of these cases have their origin in the synovia".

It is obvious how great are the difficulties in arriving at a decision on this point. Exposure of the part by operation is not an infallible method of distinction, and even the most careful X-ray examination may fail to reveal the existence of small bony foci (*see* paper by Fritz König⁴). It is suggested that the question is of more than academic interest, as it seems probable that the course of the disease is slower in the primary synovial type, and that in many such cases several years elapse before the bone is involved. The authors allude to the difficulty of diagnosis in early cases of joint tuberculosis of the synovial type. Of 208 patients treated for tuberculosis of the hip at the country branch of the New York Orthopædic Hospital during the years 1901 to 1921, it was subsequently found that 46 patients, or 22 per cent, were not tuberculous. In knee tuberculosis the proportion of error was 10 per cent. To minimize this possibility of error the procedure at the New York Orthopædic Hospital in a suspected case is as follows: A careful clinical examination is combined with X-ray, blood-count, and Mantoux and Wassermann tests. If the joint contains any fluid, this is aspirated and injected into a guinea-pig. Tuberculin tests are practised, but no great degree of reliability is attached to them. If a positive diagnosis is still uncertain, an exploratory operation is carried out; small portions of the synovial membrane are excised and

submitted to histological examination and to animal inoculation, the incision being thereafter closed without drainage.

A paragraph of great interest deals with the value of the subcutaneous injection of tuberculin for the purpose of provoking a general and final reaction in suspected cases. It was found that in small doses of 0.05 to 0.3 mgrm. cases of tuberculosis might fail to give a reaction, and that, if the dose was pushed to 3 or 5 mgrm., non-tuberculous joint affections would give a positive reaction. The test was therefore adjudged to be worthless.

The opinion is sometimes expressed that if there is a doubt regarding the tuberculous nature of a joint infection it is wiser to assume that it is tuberculous and treat it by immobilization. This is not the authors' view; they hold that no form of immobilization should be applied until the diagnosis is certain, and very reasonably draw attention to the fact that, soon after immobilization has been employed, muscle atrophy, limitation of movement, and bone atrophy appear and further obscure the diagnosis. We have always held that this is a most reasonable view to take.

In discussing the question of treatment, frank doubt is expressed regarding the value of *Helliotherapy* in arresting the progress of the disease. No doubt the authors accept the benefits of the treatment as a general body stimulant, but they deny that there is any specific effect upon the tuberculous lesion. They hold that "in order to make certain that a tuberculous joint is healed and will not recur, absolute elimination of motion is essential, and this can be obtained only by arthrodesis or fusion of the joint". It is interesting to read this expression of opinion by two such accomplished observers. Many hard things have been said and written regarding the excision of tuberculous joints, and during the past decade it has seemed that radical operation, as it may be termed, had been largely abandoned. Can it be that the pendulum has once again begun to swing into the domain of operative surgery? One asks oneself what it is that has induced the authors to express an opinion which will be regarded as unusual at the present time. We find that the possibility of recurrence and an objection to the prolonged recumbency of conservatism are the principal elements in their decision. Accepting that complete ankylosis is the only efficient safeguard against recurrence, they prefer to secure this early and radically by operative interference. Acknowledgment is made of the difficulty of ensuring arthrodesis in the hip-joint, but it is claimed that this objection has been overcome by the fusion method described in *The Journal of Bone and Joint Surgery*.³

X-ray Diagnosis.—Interest has recently been resuscitated in the question of the primary origin of tuberculosis in the neighbourhood of a joint, as to whether the focus originates more frequently in the bone or in the joint, and the relative percentage of these occurrences. Riedel found bone foci in 70 per cent of joint resections, and König gave the figure as 50 per cent. With the assistance which X rays afford, it would seem that this question could be solved without difficulty, but the problem remains, and a paper by Fritz König⁴ on the X-ray diagnosis of joint tuberculosis goes some way in explaining the difficulty. König went on the principle of contrasting X-ray appearances with the pathology of the specimen removed at operation. It is interesting to learn that "even advanced osteal processes may not show up". Until there is lamellar absorption and the occupation of the space by tuberculous granulation tissue or pus, there may be no definite X-ray reading to suggest disease. The author concludes that, since large, solid, diseased areas, two to three finger-breadths thick, may remain hidden even with good X-ray technique, the decision to operate or not to operate must be based primarily on the clinical findings rather than on the X-ray diagnosis.

Tuberculosis of the Hip-joint in Children.—Among the helpful and suggestive articles which appear in *The Lancet* under the title, "Modern Technique in Treatment", there has been a contribution on tuberculosis of the hip-joint in children from the pen of Dr. Pugh,⁷ Chief Medical Officer, Children and Surgical Tuberculosis Services, Metropolitan Asylums Board. The article is of a general nature, and it contains an able summary of the essentials in this most troublesome and serious malady. The importance of early diagnosis is urged, and an annotation is made of the various conditions one is likely to confuse with the tuberculous lesion. Thereafter Dr. Pugh says: "Apart from these, almost all suspected cases prove to be tuberculous, and the only way to guard against an error which may have serious consequences is to adopt the principle that children in whom pain or limitation of movement persists in spite of rest in bed for a few weeks should receive the treatment advocated for a tuberculous joint, unless the X ray reveals the presence of another disease". There is much to be said for this scheme of things, but there are those who criticize it, holding that in a certain proportion of cases error will arise, and a case here and there is submitted unnecessarily to the ordeal of prolonged fixation treatment. Dr. Pugh's claim for the value of institutional treatment is an appropriate one; in no disease is the value of example, precept, and fellowship more evident than in bone and joint tuberculosis. The knowledge the patient gains from his fellow-sufferers of the value and reward of patience is a boon which only those who suffer can appreciate.

Criticism is expressed of the benefits of *Heliotherapy*. In Dr. Pugh's opinion it is not the light that is paramount; its beneficial effects are shared, if not surpassed, by "the influence on metabolism of exposure of limited parts of the body to movements of air and to changes of temperature". Methods of *Immobilization* and *Extension* are discussed.

(See also HIP-JOINT, SURGERY OF.)

Diffuse Tuberculosis of the Posterior Tarsus in Children.—This is discussed by Nové-Josserand and F. Pouzet⁸ in the *Lyon Chirurgical*. The seriousness of this condition requires no comment. In the majority of cases conservative measures fail, and amputation has to be resorted to. The authors have attempted the method of astragalectomy combined with careful curettage of the diseased centres of the other affected bones. For example, in one instance the operation entailed, in addition to the astragalectomy, attention to the calcaneus, the navicular, the cuboid, and the lower tibial epiphysis. A total of 49 cases is recorded. Ollier's oblique antero-lateral incision was employed as the route of exposure in the earlier cases, but latterly preference was given to the subastragaloid route, as it was found that this gave fuller access in the more extensive type of case. A most careful analysis of the post-operative results in the 49 cases has been elaborated, and the sequelæ have been considered from a variety of different angles. The first analysis concerns mortality: 9 patients succumbed in the course of treatment—1 from diphtheria, 8 from tuberculosis, a total of 18 per cent. It is pointed out that, as this figure is not appreciably higher than that met with in cases treated by conservative measures, the operative interference is not a serious burden. Two patients succumbed at a period which post-dated the treatment of the lesion. Of the 35 survivors, 4 subsequently required amputation: 3 on account of recurrence of the disease, 1 because of the extensive deformity which had arisen secondary to an error in growth of the tibia. The results in the remaining 31 cases are fully described and discussed under the headings of function, condition of movements, shape of the foot, and anatomical results. Judged on these standards, and recognizing the seriousness of the original condition, the results can be acclaimed as exceedingly good. It is surprising how complete

may be the regeneration of bone after an extensive curettage of the centre, assuming that the periosteum and the articular cartilage are maintained intact, and it is evident that this principle has been an ideal which the operators have constantly kept in view. Another feature of pivotal importance is the retention of the navicular. If it should be necessary on account of disease to sacrifice it, a recommendation is made that the cuboid be removed in addition, in order that the foot be foreshortened and what remains of the anterior tarsus brought into relation with the overlying tibia.

The results, from whatever standard they are judged, have justified the attempt to avoid amputation. It is apparent that in every one of the recorded cases the choice lay between amputation and the process of atypical tarsectomy, and the reader will be impressed by the completeness with which the latter procedure has vindicated itself.

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TUBERCULOSIS, PULMONARY. (*See also* CHEST, SURGERY OF; SILICOSIS.)
W. H. Wynn, M.D., F.R.C.P.

ETIOLOGY.—In 1910 Fontes inoculated guinea-pigs with the filtrate produced by passing tuberculous pus through a Berkefeld filter, and found that, whilst no primary sore was obtained, certain lymph glands became enlarged, and that inoculation of splenic material into fresh guinea-pigs caused pulmonary lesions, from which acid-fast bacilli could be obtained. This experiment attracted no attention at the time, but within the last few years several French observers have studied the filterable virus of tuberculosis with important results. Bernard and Nélis¹ give a summary of this work. A typical experiment is that of Valtis, who inoculated the filtrate from tuberculous sputum into guinea-pigs. The animals showed no sore at the site of inoculation or swelling of the neighbouring lymph glands, but they wasted and died after three or four months. Post-mortem examination showed swelling of lymph glands, especially the tracheobronchial group, and small areas of consolidation in the lungs. After a long search a few acid-fast bacilli were found in the lesions. These results have been confirmed by Valtis with cultures on glycerin media and pus from caseous mesenteric glands, by Arloing and Dufourt with material from infantile tuberculosis, by Veber with pus from a pyopneumothorax, by Vesta with serous pleuritic fluid, and by Nélis with tuberculous urine. The fact therefore appears to be established that there is an ultra-microscopic, filterable form of the tuberculous virus from which the acid-fast form can be reproduced. It has not so far been cultivated. It has a characteristic pathogenic action, unlike that of ordinary tubercle bacilli. Arloing, Dufourt, and Malartre distinguish three kinds of lesions. In all three there is an absence of a primary sore and of neighbouring lymphatic enlargement. The first form is very rare. It consists of a fatal, progressive tuberculosis with scattered discrete caseous lesions in lymph glands and viscera. The second group is the most common and characteristic. It consists of a progressive cachexia, the animals dying in three or four months, and at the autopsy no caseous lesions are found, but there are glandular swellings in which with careful search a very few acid-fast bacilli can be found. The third form is benign, non-fatal, and shows itself only by a positive intradermal reaction to tuberculin. At autopsy no lesion is found.

These new facts necessitate a reconsideration of the question of *congenital tuberculosis*. The present position is that, although *in utero* infection by a tuberculous mother is possible, it occurs so rarely as to be negligible from a

practical point of view. Debré and Lelong examined 28 placentas from tuberculous women, and in no case found any tuberculous lesion or bacilli, and inoculation of guinea-pigs gave negative results. Blood from the umbilical cord was similarly inoculated into guinea-pigs, and finally careful autopsies of the bodies of 15 stillborn infants of tuberculous mothers were elaborately examined both histologically and by inoculations, with negative results. If, however, the tuberculous virus can pass through the placenta, the evidence for tuberculosis in the infants must be sought for, not in ordinary tuberculous lesions, but in the form of glandular swellings containing a few bacilli. Calmette, Valtis, Nègré, and Boquet, and later Arloing and Dufourt, found that when pregnant guinea-pigs were inoculated with the filterable virus the young showed glandular swellings containing a few rare acid-fast bacilli. Arloing and Dufourt, in March, 1926, examined the body of a premature seven-months' infant from a tuberculous mother, which died one and a half months later without any definite signs of disease. At autopsy the only lesions were swollen mesenteric glands containing a few bacilli. The filtrate from these glands inoculated into guinea-pigs showed similar glandular lesions. Calmette, Valtis, and Lacomme have made the following observations: Of 100 infants or fetuses born of 99 tuberculous mothers and separated from the mothers immediately after birth, 21 died and 10 were examined post mortem. In 9, inoculation of material from the spleen, liver, and glands into guinea-pigs caused the characteristic glandular swellings with a few acid-fast forms. In 3 infants direct examination of the glands showed a very few bacilli. It thus appears to be proved that the virus can pass through the placenta and reproduce acid-fast bacilli. Calmette and the other authors hold the view that there is a definite ultra-microscopic form of the tubercle bacillus, and that its entrance into infants before birth accounts for the not infrequent deaths from cachexia which occur during the first few months in infants born of tuberculous mothers but separated from them immediately after birth. They have been called 'unexplained deaths' to distinguish them from deaths from such causes as bronchopneumonia, diarrhoea, etc.

These new facts add another to the methods of transmission of tuberculous infection, but, as Bernard and Nélis point out, post-natal contagion, especially familial contagion, remains the chief factor to guide us in prophylactic action, and the majority of infants if separated at birth from tuberculous mothers do not develop the disease.

E. L. Opie and F. M. McPhedran² have studied the members of 100 families of patients suffering from pulmonary tuberculosis. Evidence of infection was sought by physical and X-ray examination and tuberculin tests. By special family charts it was possible to correlate the period of exposure to infection with the development of infection in various members of the family. In families free from tuberculosis, young members with few exceptions give no reactions to tuberculin and little or no evidence of tuberculosis on X-ray examination. In the presence of open tuberculosis, on the contrary, every child reacts to tuberculin, and X-ray examinations reveal in many cases one or other of the types of lesions demonstrable at necropsy, namely, nodules in the lungs and in the tracheobronchial glands in process of calcification, and, occasionally, in adolescent children, latent apical lesions. In non-contact families there is a progressive increase of infection, whereas in contact families the incidence is high throughout the early age periods. The length of contact with sputum-positive tuberculosis is an important factor in determining the spread of tuberculosis in the family, and contact during a period of three or more years causes almost uniformly a high incidence of manifest disease. Massive glandular tuberculosis of the tracheobronchial glands was found 31 times in 42 families

with open tuberculosis, 3 times in 16 families with tuberculosis but a negative sputum, and 4 times in 44 non-contact families. In the majority of children in whom this lesion is found, manifest tuberculosis is present or develops later. There was also a high incidence of marital tuberculosis. In approximately one-half both husband and wife were infected, so that there can be little doubt that the disease was transmitted from one to the other.

SYMPTOMATOLOGY.—B. P. Stivelman³ has studied the *blood-pressure* in a group of 701 tuberculous patients who were free from cardiorenal disease and metabolic disturbances. The average length of observation was about eight months. He finds that the arterial pressure in patients with minimal tuberculous disease is within normal limits for individuals of the same sex and age, and that blood-pressure determinations therefore are of little or no diagnostic value in incipient tuberculosis. The blood-pressure declines with the advance of the tuberculosis, and active cases almost invariably shows a lower arterial pressure than the comparable quiescent cases. Patients with fibroid disease apparently show higher pressure values than those with other forms of tuberculosis. This is particularly noticeable in women over 40, and is probably secondary to the influence of the menopause. The incidence of hæmoptysis is greater in those with arterial pressure below the average for their respective group. It appears, however, that the arterial pressure and hæmoptysis are not etiologically related. They are both coincidental symptoms of advancing disease. Hæmoptysis in patients with essential hypertension was seen less frequently than in cases with normal or subnormal tension. The development of a pleural effusion and the induction of artificial pneumothorax had no appreciable effect in altering the blood-pressure so long as the mediastinum was not unduly displaced. An increase or a decline in blood-pressure of patients under treatment does not offer a reliable indication as to the course of the disease. However, it appears that the initial blood-pressures are of some prognostic value. Those with higher pressure than the average for the age, sex, and extent of involvement do better than those whose pressure is below the average for the group.

R. A. Bendove,¹ in 145 cases with definite *pulmonary cavitation shown by X-ray examination*, found that 45 per cent lacked the classical physical signs. This supports Burnand and Garrard's observation that 55 per cent of cavities are 'silent'. There are two kinds of silent cavities: (1) Absolutely mute, i.e., no stethoscopic signs are elicited and no adventitious sounds are heard; (2) Relatively silent, i.e., cavities in which the classic signs of cavitation are absent, but other signs, such as râles, bronchovesicular breathing, and auscultatory percussion sounds, are present. The latter are twice as common as the former. The size of the cavities bears no relation to the signs. Many factors are no doubt responsible for the variable signs of these cavities, the most important being: obstruction of the afferent bronchus by fibrosis or mucopurulent material, soft ragged cavities which fail to respond to the vibrations of the entering air, changes in the medium of conduction of the breath-sounds produced by surrounding pneumothorax or emphysema. He considers that X-ray examinations should always be used to corroborate physical observations. Although no single sign can be considered pathognomonic for such cavities, yet a certain group of signs taken collectively suggest strongly their presence—bronchovesicular breathing or harsh inspiratory sound, with moist bubbling râles over a limited area in any zone of the pulmonary field below the second rib.

L. H. Fales² discusses the *relative value of X rays and physical signs* in the diagnosis of pulmonary tuberculosis. He finds that a parenchymal X-ray lesion without physical signs is of great significance, as 53 per cent of such cases showed a positive sputum; but physical signs without an X-ray parenchymal

shadow are of doubtful significance, as all had a negative sputum. Peribronchial infiltration is of no importance in diagnosing tuberculosis, as it was not in any case found with a positive sputum, whereas parenchymal infiltration as seen by X rays was associated with 68 per cent of positive sputa. In certain cases the X rays will show a lesion not demonstrated by physical signs, and X rays more often show a greater involvement than is revealed by physical signs. A parenchymal X-ray lesion and râles usually occur together, this combination being present in 93 per cent of cases, while peribronchial infiltration and râles are almost never found in combination. Serial X-ray films taken at from two- to six-month intervals give an insight into the progress of the case which can be obtained in no other way. He considers that we must discard the idea that peribronchial thickening when it reaches the periphery, and infiltration of the hilum, have any significance in the diagnosis of pulmonary tuberculosis.

F. M. McPhedran⁶ has made a study of *tracheobronchial tuberculosis*: 400 pairs of excised lungs were examined by X rays, and then the specimen compared area by area with the X-ray picture. He finds that calcium infiltration is the sole distinctive X-ray indication of the site of a lymph node within the limits of the mediastinum. Calcium-free glands, however enlarged, fail to cause perceptible intensification of the shadow. The protrusion of the mediastinal wall beyond the shadow of the spine and sternum by caseous lymph nodes is rare except in fatal infantile cases. Intrapulmonary glands must contain calcium to be recorded by X rays. When they are large, that part of their calcium-free margins which projects beyond the main arterial stem will be recorded by contrast with the pulmonary parenchyma. Reabsorption of calcified caseous necrosis within lymph nodes does not occur. Shadows simulating calcification are thrown by vessels axially radiated. No symptom-complex was found characteristic of tracheobronchial tuberculosis, and respiratory symptoms due to uncomplicated tracheobronchial disease do not occur.

Calmette's Prophylactic Vaccination.—Several mass inoculation experiments on laboratory animals and on calves in the Ukraine and Italy as well as in France are reported,⁷ and they show that very effective protection can be given both to experimental and spontaneous infection by the use of the B.C.G. vaccine (MEDICAL ANNUAL, 1926, p. 486; and 1927, p. 501). In infants the method of vaccination consists in giving three doses each of 10 mgrm. of a non-virulent strain of tubercle bacilli by mouth in a little milk during the first ten days of life. A considerable number of infants have now been treated, and the results are given in the same journal by two statisticians. M. Moine reported on 982 infants vaccinated for more than one year. Of these, 13 were removed soon after birth and put out to nurse. The remaining 969 lived in contact with a case of open tuberculosis in the same house; 882 had been vaccinated from one to two years previously, and 87 for more than two years. For the first group of 882 the general mortality was 8.9 per cent and the probable tuberculous mortality 0.8 per cent. For the second group the tuberculosis mortality was nil. Y. Biraud reported on 1387 infants brought up in a tuberculous environment and vaccinated during the years 1924–26. The general mortality during the first year of life was 7.29 per cent and the tuberculous mortality 1.84 per cent. Similar results have been obtained in other parts of France, in Belgium, Roumania, Algeria, and Indo-China. The tuberculosis mortality amongst the non-vaccinated infants brought up in a tuberculous environment is difficult to ascertain in the absence of compulsory notification, but statistics obtained from tuberculosis dispensaries assess it at 25 per cent, although statistics from other quarters in France range from 32 to 82 per cent. It would seem therefore that the tuberculosis mortality among vaccinated infants is about 1 per cent,

and among the non-vaccinated at least 25 per cent. This striking difference raises the question whether the infants in the two groups are statistically comparable. The vaccinated group may have been under better observation and brought up with stricter precautions, although both groups were obtained from tuberculosis clinics, were brought up in their own homes, and belonged to tuberculous families. The French mortality-rates appear very high as compared with those of other countries. R. Kjer-Petersen and J. Ostenfeld,⁸ of Denmark, found a mortality of 7.7 per cent during the first year of infants brought up in homes with open tuberculosis, and in 4.9 per cent the cause was undoubtedly tuberculosis. Bergman,⁸ of Upsala, whose statistics included 1004 infants, found 86 deaths in the first year, 36 being from tuberculosis. He concluded that when both parents are tuberculous the death-rate from tuberculosis of their infants under one year was 9.6 per cent, and when only one parent was tuberculous it was 5.2 per cent. These estimates are much below those of Calmette.

It is impossible at present to give the duration of the protection conferred by the vaccine. In calves the protection against experimental infection is about fifteen to eighteen months, but is probably much longer against spontaneous infection. In infants it would seem to last at least five years, as those vaccinated in 1922 have not developed tuberculosis up to date, and it is during the first five years of life that children are particularly exposed to massive infection. Calmette⁹ considers that it would be an advantage in the case of infants in a tuberculous environment to revaccinate at the end of the first and third years, but that this is unnecessary in the case of infants brought up in healthy families.

The ingestion of the vaccine has not given rise to any harmful results, and the vaccinated children remain in good health after four or five years. The possibility that the attenuated bacilli might become virulent after a long period has been suggested. In an inoculated calf the bacilli were obtained in a living state after a year, and inoculated into a guinea-pig with a negative result. It is possible that vaccination may not protect against previous intra-uterine infection, or—since immunity takes about three weeks to develop—against a massive infection during this time; but in all forms of protective inoculation there is occasional failure, and the evidence at present is that the Calmette method is both safe and efficacious.

TREATMENT.—This has been fully dealt with in recent numbers of the MEDICAL ANNUAL, and nothing fresh has appeared during the year.

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TUBERCULOSIS OF THE SPINE. (*See SPINE, TUBERCULOSIS OF.*)

TUBERCULOUS MENINGITIS. (*See MENINGITIS, TUBERCULOUS.*)

TULARÆMIA.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—B. C. Farrand,¹ who reports eleven illustrative cases, defines tularæmia as an acute infectious disease caused by *Bacterium tularensis*. It was first described by McCoy in 1911 as a 'plague-like disease of rodents', and by Pearse in the same year as 'deer-fly fever'. It has also been called 'rabbit fever' and 'glandular type of tick fever'. The name 'tularæmia' was suggested by Edward Francis in 1921, since the causal organism was isolated by McCoy and Chapman in 1911 from squirrels in

Tulare County, California. The disease has now been reported from 23 of the United States and the District of Columbia. Transmission usually takes place by the wood tick, which also transmits Rocky Mountain spotted fever. Infection may also be carried by briars and burs which have been in contact with infected material. Laboratory workers have been infected by the urine and feces of rabbits. Two types of the disease have been described, viz., the glandular and the typhoid. The glandular type is characterized by fever and prostration and a small reddened area at the point of infection, with inflammation and often suppuration of the corresponding lymphatic glands. In the typhoid type, fever of varying degree lasts a considerable time.

According to R. Breinl,² in some cases a papular scaly eruption appears in the first week, and is often accompanied by swelling of the tonsils and nasal mucous membrane, conjunctivitis, and purulent dacryocystitis. Agglutination of *B. tularensis* is of diagnostic value. Agglutinins appear in the blood in the second week, and reach their fullest development in the third to the seventh week. Animal inoculation by injection of the patient's blood is also of diagnostic assistance. Recovery is slow, but always takes place in otherwise healthy persons. Only three deaths have hitherto been recorded. Treatment is purely symptomatic. A fatal case has since been recorded by L. H. Rutledge³ in a man, age 39, whose symptoms resembled those of typhoid fever. Death occurred on the fourteenth day, and the diagnosis of tularemia was confirmed by the serum-agglutination test.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1926, clxxii, 833; ²*Seuchenbekämpfung*, 1927, 75; ³*Jour. Amer. Med. Assoc.* 1927, lxxxviii, 788.

TYPHOID FEVER. (See also PARATYPHOID FEVERS.) J. D. Rolleston, M.D.

EPIDEMIOLOGY.—The fifteenth annual report of the *Journal of the American Medical Association*¹ on typhoid in the 69 cities in the United States with a population of more than 100,000 shows, as in previous years, the typhoid mortality according to the geographical division of the United States Bureau (see MEDICAL ANNUAL, 1926, p. 498). In spite of a population increase of over eight million, the number of typhoid deaths has fallen from 4143 in 1910 to 822 in 1926, and the rates per 100,000 of the population from 19.61 to 2.76. For the first time since the summaries have been undertaken, as many as four cities have been without a death from typhoid, and in more than a dozen the typhoid rate has been less than 1.0.

In the official report² on the epidemic of typhoid fever at Hanover in the autumn of 1926 it is stated that the epidemic was preceded by a sudden outbreak of febrile gastro-intestinal catarrh during the last fortnight of August. With few exceptions the attacks were mild, and only a few cases were admitted to hospital. On the lowest estimate there were from 20,000 to 30,000 cases of this kind. The attacks were generally attributed to the drinking water, which many persons at the time noticed had a bad taste. No definite organisms, however, connected with intestinal infection, such as bacilli of the typhoid or dysentery group, were detected, and subsequent serum tests were also negative. The first 20 cases of typhoid fever were admitted to hospital on Sept. 7, and in the course of the next twelve days about 1700 cases were notified, with 70 deaths. As all other causes, such as contact infection, contaminated milk or other articles of food, could be excluded, suspicion fell upon the water-supply, and was confirmed first by the close resemblance of the course of the epidemic to that of other epidemics caused by contamination of the water-supply, and secondly by the distribution of the cases corresponding to the districts supplied by various water-works in Hanover. According to a subsequent report by M. Kahn,³ there were 2423 cases of enteric in Hanover between August and

the end of December, 1926, with 282 deaths. The great majority of the cases—2224—were typhoid, and the rest paratyphoid alone or in association with typhoid.

The report⁴ of the United States Public Health Service states that from March 1 to June 28, 1927, 4755 cases of typhoid fever were notified in Montreal, with 453 deaths, as compared with 37 cases with 11 deaths, 48 cases with 18 deaths, and 44 cases with 21 deaths for the corresponding periods of 1926, 1925, and 1924 respectively. There has thus been a severe epidemic of typhoid fever in Montreal since March, 1927, with a case incidence in proportion to population probably unprecedented in any other large city in the world within the present century. There was no evidence that either the city water-supply or the city sewerage system was responsible. The disease was distributed over the greater part of the area of the city, with much more concentration in proportion to population of some sections than in others. Soon after the beginning of the epidemic it was found that a very large proportion of the cases were in persons who had drunk milk from a certain dairy company, and that a very considerable proportion of the milk had escaped efficient pasteurization.

SYMPTOMS AND COMPLICATIONS.—P. Carnot, E. Libert, and M. Bari  ty⁵ record a case of *nephrotypoid* in a boy, age 14½, which presented the following remarkable features: (1) The symptoms were confined to those of a primary h  morrhagic nephritis with lumbar pain and profuse h  maturia. The case thus resembled the classical examples of nephrotypoid described by Amat, Gouget, Curschmann, and Meyer. The typhoid origin of the nephritis was shown by cultivation of the blood, urine, and bile. (2) The absence of renal sequel  . (3) A comparative study of the urine and bile showed that the excretion of typhoid bacilli in the bile commenced later but persisted longer than in the urine.

H. Schaeffer and R. Li  ge,⁶ who report a case of *arthrotypoid*, state that three principal forms of joint manifestations may be found in typhoid fever. The first is an arthralgic form characterized merely by transient pains in the joints. The second form is suppurative arthritis involving several joints or more frequently a single joint, especially the hip, and ending in ankylosis or spontaneous dislocation. The third form consists of serous polyarthritis resembling acute articular rheumatism. As a rule joint manifestations do not occur until the beginning of defervescence, but in very rare instances they constitute the first sign of typhoid septic  mia, so as to merit the title of arthrotypoid proposed by Robin and Leredde. As three of the nine cases on record were fatal, the prognosis of arthrotypoid is grave. Although the examination of the serous fluid of the joint was negative in the only case in which it was examined, the affection of the joint is probably due to localization of typhoid or paratyphoid bacilli. In most cases the cause of localization is obscure, but in one instance there was a recent trauma, and in another the patient had had a recent attack of acute articular rheumatism.

T. Luccherini,⁷ who reports two cases, states that *pleurisy* in typhoid fever is rare (1.5 to 2.5 per cent of all cases). It may occur at the onset of the disease, and for a time disguise the nature of the typhoid infection (pleurotypoid), or, as more frequently happens, develop in the second week or even in convalescence. The effusion may be serous, serofibrinous, h  morrhagic, or purulent. The pleurisy may be due to the exclusive action of the typhoid bacillus or to association with the ordinary pyogenic organisms, but sometimes cultures are sterile. The effusion may sometimes be saccular, a purulent fluid being found in one compartment and a serofibrinous fluid in another. In very rare cases the pleurisy may be bilateral or form part of a polyserositis. Cytological examination shows predominance of large mononuclears, or more

or less damaged polymorphonuclears, with a few mononuclears, lymphocytes, large endothelial cells, and red corpuscles.

C. I. Urechia⁸ records a unique case in a man, age 28, of a *subdural abscess in the spinal cord* situated between the 8th and 12th dorsal vertebræ, having arisen by direct continuity with a pleurisy which occurred at the end of an attack of typhoid fever. Evacuation of the abscess saved the patient's life, but did not affect the paraplegia, which was complete and accompanied by slight paræsthesia.

J. Jacobi⁹ states that in a small proportion of cases *sudden death* may occur in enteric fever. It takes place usually in convalescence irrespective of the patient's age and constitution. The two principal causes are myocarditis and vasomotor paralysis on the one hand and pulmonary embolism on the other. Myocarditis usually develops in the second or third week of disease, and early signs of circulatory weakness are to be attributed to vasomotor paresis. Myocarditis is recognized by the relative bradycardia of typhoid fever being replaced by tachycardia, an irregular and unequal pulse, dilatation of the heart, and the appearance of murmurs. Often, however, the myocarditis responsible for sudden death is not manifested by any clinical signs. Both myocarditis and vasomotor paresis are much commoner in typhoid than in paratyphoid, in which such complications are rare and only seen in the severe forms. Pulmonary embolism may be due to thrombosis in a peripheral vein, or less frequently to cardiac thrombosis.

D. Y. Keith and J. P. Keith¹⁰ maintain that *bone infection* in typhoid fever is much more frequent than is indicated by statistics, as in a large proportion of cases suppuration does not occur. It is much commoner in males than in females, because a larger proportion of males have typhoid fever, and owing to their occupation are more liable to injury to their osseous system. The complication may occur as early as the thirteenth day or as late as forty-five years after the onset of the typhoid infection. Almost every bone in the skeleton may be affected, but the most frequent are those exposed to trauma—the ribs, tibia, spine, femur, humerus, ulna, foot, clavicle. The infection may involve the medulla, periosteum, osseous tissue, or cartilage. Periosteal involvement is usually much less than in syphilitic periostitis, and bone destruction is much less than in metastatic bone destruction so frequently seen in the young.

J. D. Rolleston¹¹ reports a case of *striae patellares* following typhoid fever in a girl of 14. The attack was typical but not accompanied by any serious complications. The striae, which were first noticed on the forty-third day of disease, consisted of symmetrical, purplish, transverse stripes situated above the upper border of each patella. This phenomenon, which is a localized form of the condition variously known as *striae albigantes*, *striae atrophicæ*, or *striae cutis distensæ*, is met with after many infectious diseases, but is commonest after typhoid fever. Rolleston has also recently seen a case after paratyphoid B. Striae patellares probably have a mechanical causation due partly to rapid growth. They have also been attributed to the flexed attitude of the knees when lying in bed.

J. D. Rolleston¹² also reports the first case on record of *trichotillomania* in typhoid fever. The patient was a mentally backward and undersized boy of 10 years, who developed the tic of pulling out the hair from his scalp at the end of the second week of a moderate attack of typhoid fever. The tic continued for about a month, and could only be prevented by putting both arms in splints. There was no local source of irritation in the scalp, and the hair showed no evidence of ringworm. The scalp in the left frontoparietal region presented an area of alopecia resembling that caused by X-ray treatment of ringworm, and the eyelashes of the left upper lid were scanty and broken.

DIAGNOSIS.—H. Henning and A. Lechner¹³ carried out duodenal intubation for bacteriological diagnosis in 36 cases of typhoid and paratyphoid. In 26 per cent typhoid or paratyphoid bacilli were found in the duodenal fluid, and in 53 per cent in the bile. In 2 cases the bacilli could only be detected by duodenal intubation. In only a few cases, however, could large quantities of bacilli be found in the duodenal fluid or bile. The importance of not attaching much diagnostic value to a positive Widal reaction in persons who have recently been inoculated is shown by Schembra¹⁴ who during an epidemic of typhoid fever examined the reaction in healthy doctors and nurses who had been inoculated against the disease and found much higher agglutination titres than had ever been described before, viz., 1-800 to 1-12,800 a fortnight after inoculation with three injections, and from 1-200 to 1-1200 after inoculation with only two injections. All had been kept under close observation, so that ambulatory typhoid could be excluded. The stools and urine had been repeatedly examined for typhoid bacilli with negative results, so that there could be no question of a carrier state.

PROPHYLAXIS.—C. Achard¹⁵ records statistics of 124 cases of typhoid fever admitted to his wards since October, 1919, to show the effect of antityphoid inoculation during the war on the incidence of the disease. Only 32, or 29.8 per cent, were males, while 92, or 74 per cent, were females. Of the 32 males, 20, or 62.5 per cent, were under 20 years of age, while of the 92 females only 16, or 17.3 per cent, had not reached 20. Of the 124, 116 had not been inoculated at all, in 1 no definite information could be obtained, and only 7 patients, or 5.6 per cent, had been inoculated. Of these, 2 could be excluded, as one had been inoculated with typhoid vaccine only and had a mild attack of paratyphoid B, and the other was a woman who swallowed keratinized pills of antityphoid vaccine, and three months later had a severe attack of typhoid from which she recovered. Of the remaining 5 cases, in which the attack developed from four to seven years after inoculation, 2 were severe and fatal and 3 mild.

TREATMENT.—During the last four years V. Bie¹⁶ has used Vaccines in the treatment of typhoid and paratyphoid fevers. In the first two years he employed a typhoid vaccine, but during the last two he has substituted a staphylococcal vaccine, which gives as good results and does not interfere with the Widal reaction.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1927, lxxxviii, 1148, 1182; ²*Klin. Woch.* 1926, 2412; ³*Med. Klinik*, 1927, 1009; ⁴*Pub. Health Rep.* 1927, 1903; ⁵*Paris méd.* 1926, ii, 243; ⁶*Ibid.* 1927, i, 346; ⁷*Riforma Med.* 1927, 211; ⁸*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1927, 1137; ⁹*Med. Klinik*, 1927, 316; ¹⁰*Jour. Amer. Med. Assoc.* 1926, lxxxvii, 2145; ¹¹*Proc. Roy. Soc. Med.* xx (Child. Sect.), 1926-7, 9; ¹²*Ibid.* 27; ¹³*Munch. med. Woch.* 1927, 579; ¹⁴*Deut. med. Woch.* 1927, 1133; ¹⁵*Progrès méd.* 1927, 615; ¹⁶*Acta Med. Scandinavica*, 1926, 160.

TYPHUS FEVER.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—Under the name of 'tropical typhus' W. Fletcher and J. E. Lesslar¹ describe a disease which differs from ordinary typhus by its low infectivity, though the symptoms and behaviour of the Weil-Felix reaction are the same in both forms. The epidemiological features of tropical typhus are fundamentally distinct. There is no evidence of direct infection from man to man, and no body lice are found on the patients, but the virus seems to be connected with open, uncultivated grazing land. One of the most striking features of the disease in the Federated Malay States is the race incidence, most of the patients being Europeans or Punjabis, who form a very small proportion of the population. Nearly all the Asiatic patients were cow-keepers, and the high incidence of the disease among the Punjabis was probably due to

many of them following this occupation. The number of Europeans affected is explained by many of them being associated with the same source of infection. (*See also* TYPHUS, TROPICAL.)

K. F. Maxcy² describes a disease present in the South-Eastern United States giving a positive Weil-Felix reaction and clinically indistinguishable from typhus fever except in regard to its relative mildness and low fatality. Apart from a group of cases occurring in Alabama and Savannah, Galveston, on which Maxcy's report is based, evidence has been collected of the existence of mild typhus corresponding to the description of Brill's disease in other cities and towns in North and South Carolina, Georgia, and Florida. The epidemiology of the disease differs in the following respects from that of typhus in the Eastern hemispheres: (1) The disease reaches its maximum in the summer and autumn, in contrast with the higher winter and spring incidence of Old World typhus. (2) There is no evidence that the disease is transmitted by the louse, which is the usual carrier of Old World typhus. (3) It does not select the poor and uncleanly, but occurs among all classes, and no cases were found in prisons or asylums. Maxcy suggests that the source of infection is other than man, and is to be found in rodents, probably rats or mice, from which the disease is occasionally transmitted to man. This hypothesis is compatible with the epidemiological characteristics, viz.: (1) The uneven focal distribution of the disease; (2) Its sporadic occurrence; (3) Its apparent lack of direct communicability from an infected person; (4) Its association with the place of business rather than with the home, particularly with those premises in which food-stuffs are handled or stored; (5) The recurrence of cases on the same premises after considerable intervals of time; and (6) Its seasonal incidence. A similar outbreak, differing from classical typhus by its mild non-contagious character, the absence of lice, and prevalence in the hot season of the year, has been described by D. Olmer³ under the name of 'an eruptive infection of undetermined nature', but has been identified with Brill's disease by A. Netter,⁴ who shows its resemblance to the cases of Fletcher and Lesslar, and Maxcy.

J. Bablet, Mesnard, and Polidor⁵ record an outbreak of typhus fever which occurred at the prison of Hanoi (Tonkin) in March, 1926, and continued for several months. The clinical symptoms, and the presence of lice on the patients' clothes in spite of the absence of an eruption, suggested the diagnosis of typhus, which was confirmed by the Weil-Felix reaction and inoculation of guinea-pigs. There were 150 clinical cases, with 16 deaths—a mortality of 10·6 per cent—but the study of the sick register suggested that there were about 150 more mild cases in the prison, which would reduce the mortality to 5·3 per cent, and this retrospective diagnosis was supported by the Weil-Felix reaction. The writers suggest that owing to the absence of laboratory examination many cases of typhus have been included in Indo-Chinese statistics under the heading of dengue or malaria.

A. Davidson and R. Cruickshank⁶ report an outbreak of eight cases of typhus which occurred in one of the lower working-class districts of Glasgow during the end of July and first fortnight of August, 1926. Seven were members of the same family, and one was a friendly neighbour. All but one recovered. The source of infection could not be discovered.

BACTERIOLOGY.—B. Fejgin, R. Kaczynski, and Szwojicka⁷ made 143 examinations of the blood, urine, and faeces of typhus patients and obtained cultures in 16 (11·2 per cent). In every case the Weil-Felix reaction was positive in dilutions ranging from 1-1600 to 1-3200. In several cases in the absence of serum the reaction was performed with the patient's urine, and positive results were obtained in the same dilutions; 106 blood cultures yielded 14 strains which were varieties of *Proteus* X 19.

SYMPTOMS AND COMPLICATIONS.—A. Mezbourian,⁸ in a paper on the *association of typhus and relapsing fever* in children, remarks that epidemics of relapsing fever almost always coincide with those of typhus, as both are diseases which arise under similar circumstances. The four following groups of association may be met with: (1) Relapsing fever precedes typhus. In this group either infection with relapsing fever has taken place first, or infection with both diseases has been simultaneous. (2) The onset of relapsing fever and typhus takes place on the same day. In this group the patient was first infected with typhus, and it was not until a few days later that the spirillum of relapsing fever made its way into the blood. (3) Relapsing fever develops at the height of typhus or during its decline. In such cases infection with relapsing fever takes place during the period of invasion of typhus or at the commencement of the fastigium. (4) Relapsing fever as a sequela of typhus. In such cases infection with relapsing fever has taken place towards the end of the fastigium or during the period of decline or even at the beginning of convalescence. In addition to these typical forms of association there are a number of atypical forms which, though rare in adults, are frequent in children, and are characterized by a mild and abortive course, varying from 25 days to 24 hours.

DIAGNOSIS.—Davidson and Cruickshank⁶ found that the Wassermann reaction performed before the crisis was positive in four out of six cases. Their findings thus agreed with those of Bauer, who maintained that a positive Wassermann reaction before the crisis was helpful in the diagnosis between typhus and typhoid fever. (*See MEDICAL ANNUAL*, 1923, p. 483.)

PROPHYLAXIS.—C. Nicolle, H. Sparrow, and E. Conseil⁹ state that until endemic typhus can be stamped out by the destruction of lice the following two methods should be employed. The first, which consists in the use of convalescent serum, confers an immediate but only temporary immunity, and is specially suited for the protection of carriers of infected lice. The second method, which confers a less rapid but more permanent immunity, consists in the injection of small and gradually increasing doses of the serum of typhus patients or infected guinea-pigs.

TREATMENT.—C. Zielinski¹⁰ recommends subcutaneous or intravenous injection of the Patient's Cerebrospinal Fluid in all severe cases of typhus on the eighth or ninth day of disease. He claims that if it is employed at this time it shortens the duration of the disease, has a more soothing effect than any narcotic, raises the blood-pressure, increases diuresis, and facilitates deglutition.

REFERENCES.—¹*Bull. Inst. Med. Research Fed. Malay States*, 1925, No. 2; ²*Pub. Health Rep.* 1926, 2967; ³*Bull. de l'Acad. de Méd.* 1927, xcvm, 59; ⁴*Ibid.* 71; ⁵*Bull. Soc. de Pathol. exotique*, 1926, 766; ⁶*Lancet*, 1927, i, 887; ⁷*Compt. rend. Soc. de Biol.* 1927, xvi, 341; ⁸*Arch. de Méd. des. Enf.* 1926, 441; ⁹*Arch. Inst. Pasteur de Tunis*, 1927, 1; ¹⁰*Paris méd.* 1926, ii, 225.

TYPHUS, TROPICAL.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

This subject is dealt with further by W. Fletcher and J. E. Lesslar^{1, 2} on the basis of their experience in the Malay States, where the disease is endemic in a mild form with a very low mortality—5 deaths in 500 cases—and gives positive Weil-Felix reactions. For this test they advise the use of both the indologes, or indol-producing, group of *B. proteus*, and the an-indologes group, as they have found two distinct groups of tropical typhus in the Malay States in accordance with whether they agglutinate one or other of these groups of *B. proteus*. Neither were transmitted by lice, and they attack especially cattle-keepers and drivers, who work on waste grass-covered land; so they suggest the disease may be carried by a mite or tick living partly on cattle and partly on rodents. Guinea-pigs could not be infected with the disease. In testing the Weil-Felix reaction, living cultures should be used, and repeated

tests made after the temperature has come down in the third and fourth weeks. R. N. Banerjee³ records two more cases in the Kamaon Hills of India, which are similar to those first described by Megaw in this area.

REFERENCES.—¹*Jour. Trop. Med. and Hyg.* 1926, Nov. 15, 374; ²*Ind. Med. Gaz.* 1926, Nov., 529; ³*Ibid.* 1927, May, 264.

ULCER, GASTRIC. (See GASTRIC AND DUODENAL ULCER.)

ULCERS OF THE SKIN. (See SKIN, ULCERS OF; VARICOSE VEINS AND ULCERS.)

UNDULANT FEVER. (See MALTA FEVER.)

URETERS, DILATATION OF, IN CHILDREN.

Reginald Miller, M.D., F.R.C.P.

Dilatation and hypertrophy of the bladder and ureters is a condition which has given rise to much speculation. Although in many of the cases described a definite organic obstruction in the urinary tract was found post mortem, a number still remain in which no such obstruction was revealed and the condition stood unaccounted for. In the light of recent studies by Poynton and Sheldon,¹ however, it is probable that a large proportion of these apparently 'idiopathic' cases have an organic basis. These writers draw attention to the fact that unless the whole urethra and bladder are removed in continuity, a valve-like fold of mucous membrane in the urethra may very easily escape observation. A probe may often be passed from the meatus into the bladder, though the arrangement of the fold may prevent the passage of a probe, and of urine, in the reverse direction, owing to the fact that the free edge is directed inwards towards the bladder. Such a urethral valve is described in one of their cases, and the condition is well displayed in *Plate XLII*. Since it is usual in making autopsies to divide the urethra at its junction with the bladder, it is easy to understand the likelihood of similar obstructions having been overlooked in many hitherto unexplained cases.

The most interesting group of cases described is that in which, with a normal bladder and no obvious obstruction, dilatation of one or both ureters is found. An analogy may be drawn between this condition and congenital idiopathic dilatation of the colon; but no case of this kind is included in the series examined by Poynton and Sheldon, who were able in all their specimens to demonstrate some form of organic obstruction definite enough to account for the dilatation; and it seems likely that a careful dissection of the whole urinary tract in continuity would reveal some degree of obstruction, congenital or acquired, in most of the cases if the possibility were borne in mind while making the autopsy. Where the obstruction takes the form of a stenosis of the terminal portion of a ureter, as shown in *Plate XLIII*, the case may appear obscure until a complete dissection is carried out, as adhesion of the parts may conceal the short stenosed section, and the ureteric orifice in the bladder may appear perfectly normal. The fact that the group of cases hitherto regarded as idiopathic can be subdivided into those in which the bladder shares in the condition, and those in which the dilatation and hypertrophy are limited to one or both ureters, strengthens the view that an organic origin for most cases could be found, while it is noticeable that no specimen in the paper referred to showed a hypertrophied bladder without both the ureters being also affected. In the cases with bladder involvement, with or without obvious cause, a constant symptom is enuresis of a peculiarly distressing type, the urine dribbling away perpetually so that it is impossible to keep the child dry. It is remarkable that the condition is usually painless even in the presence of gross obstruction.

The final picture in this group is that of a chronic infection of the urinary tract, most of the cases becoming infected with the *Bacillus coli*. Pyelography of a child with well-marked uræmic symptoms having drawn attention to the association of painless enuresis, dilated bladder, and ureters, suggested the more frequent use of the cystoscope in cases of pyelitis presenting unusual features or repeated relapses, and thus several cases of dilatation were revealed which might otherwise have passed for simple pyelocystitis. Plate XLIV shows the tortuosity of the dilated ureters as displayed in the case referred to.

In the other main group of cases, i.e., those in which the bladder is not involved, the symptoms are more equivocal, often failing to draw attention to the urinary system at all during life. Where there is obvious and gross obstruction in the ureter, death may occur at a very early age.

In considering the possibility of an organic cause being found for most of these cases of ureteric dilatation, it is interesting to note the occurrence of associated horse-shoe kidney with several of the cases collected by Poynton and Sheldon. The common phenomenon of two or more congenital malformations in one subject has long been remarked, and this perhaps lends support to those observers who uphold the 'idiopathic' theory of causation of this condition. The same paper also quotes a case recorded by Grant of a child whose ureters were shown by pyelography to be much dilated, the condition being considered secondary to infection, in whom a very considerable improvement was brought about by irrigation only.

REFERENCE.—¹*Arch. Dis. in Childhood*, 1927, ii, 251.

URETERS, DISEASES OF.

Sir John Thomson-Walker, F.R.C.S.

Stricture of the ureter is stated by Hunner,¹ of Baltimore, to be a very common condition in women. This author gives a summary of the etiology and symptomatology of *ureteral stricture in women*, basing his remarks "on an experience with more than 2500 cases studied in the past fifteen years". The condition is an "intrinsic disease of the ureteral wall resulting in narrowing of the lumen which leads to varying degrees of stasis in the urinary stream". Some cases of stricture are congenital, but by far the greater number are acquired, among the causes of which the writer mentions traumatism, syphilis, pressure and adhesion due to ovarian cyst or fibroids of the uterus, cancer of the cervix itself or as the result of inflammatory infiltration following on the use of radium or the cautery in this disease, and as a secondary manifestation in renal tuberculosis. The writer states, however, that "simple inflammatory stricture due to a focal infection in some other part of the body is so overwhelmingly frequent when compared with stricture from all other causes, that we are justified in saying that the disease usually originates from some such focus". In cases of *pyelitis*, *infected hydronephrosis*, and *pyonephrosis*, Hunner² states that ureteral stricture is usually the primary lesion in the urinary tract, and that the infection is secondary and is due to urinary stasis caused by the stricture. During the past three or four years the writer has given up lavage of the renal pelvis with antiseptics in the treatment of pyelitis, and is now getting "far better results with dilatation and drainage alone."

In more than 200 cases of renal and ureteral calculi he has found that ureteral stricture and calculi are associated in more than 90 per cent of the cases. He concludes that by early diagnosis and treatment of ureteral stricture, including the eradication of the causative focal infection, the incidence of stone-formation should be greatly reduced. [These views are not generally accepted by urologists, the proofs of ureteral stricture advanced by the author not being sufficiently convincing.—J. T.-W.]

A. Ravich³ regards obstruction in some part of the urinary tract as probably

PLATE XLII

DILATATION OF URETERS IN CHILDREN

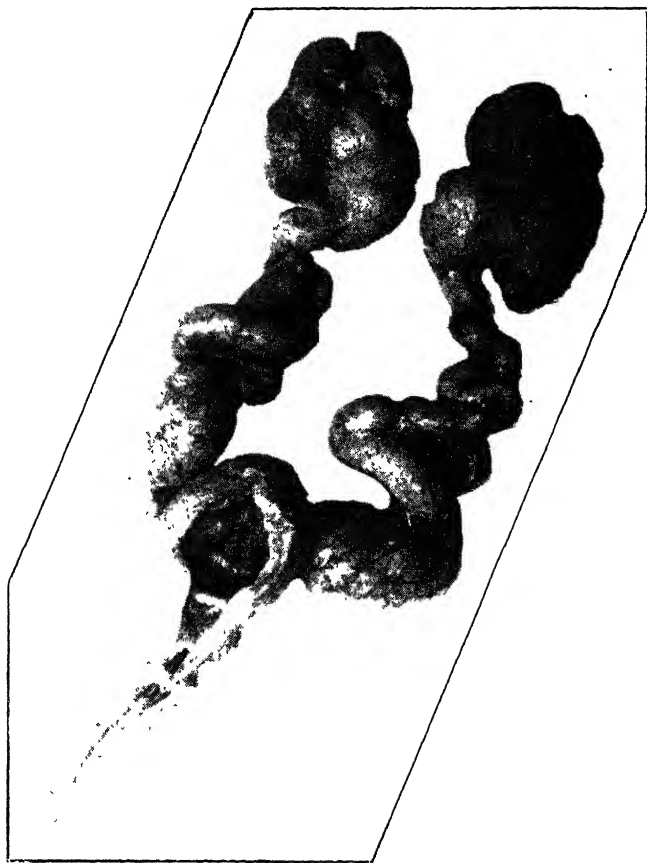


Fig. 1.—Showing the whole urinary tract. A dark probe has been passed beneath the valve in the posterior urethra

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PLATE XLIII

DILATATION OF URETERS IN CHILDREN—continued

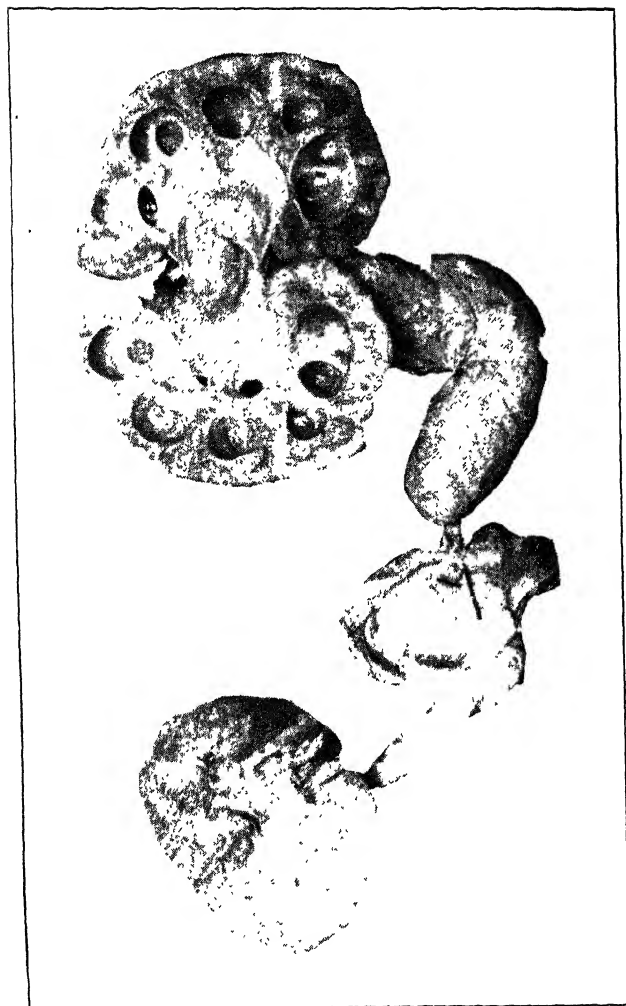


Fig. 11.—Showing the condition present in another case. The left ureter is very dilated, except for the narrow terminal portion close to the bladder. Bristles have been passed through the ureteral orifices from the bladder.

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PLATE XLIV

DILATATION OF URETERS IN CHILDREN—*continued*



Fig. C.—Skiagram showing both ureters dilated and tortuous. The pelvis of the right kidney can be seen to be very dilated.

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'Archives of Disease in Childhood'*

the most important factor in the causation of urinary lithiasis and its retarded passage through the ureter. The large percentage of recurrent calculi is due to failure to correct the urinary stasis. The writer regards diet as having little if any influence on the formation of urinary calculi. W. S. Pugh,⁴ from his observation of 100 cases of renal and ureteral calculus, is impressed by the fact that infection associated with an interference with the urinary flow was easily demonstrated in practically every case. As regards the infective element, he considers the *B. proteus* to be one of the most important factors in stone production.

N. E. Ockerblad⁵ reports 81 cases of *ureteral stricture in the male*. The youngest patient was 3 years of age and the oldest 74 years. In all, the strictures were located in the lower half of the ureter by means of the wax-bulb catheter and ureterography. The clinical pictures presented were very variable, no one symptom or set of symptoms being found in a sufficient number of the cases to suggest a definite clinical picture for the condition. Twelve of the cases were associated with renal or ureteral calculi, and in 3 cases the ureteral stricture was tuberculous in origin. The writer states with reason that "more experimental data and much necropsy testimony are needed to write convincingly on this subject and to establish the pathology of this newly recognized disorder". A. H. Peacock and R. F. Hain⁶ discuss ureteral stricture on the basis of 76 cases, 45 of which were males. The writers state that the condition is not uncommon, and is more frequent in women. Renal colic is frequently initiated by the condition and simulates that due to calculus. Many obscure abdominal pains may be traced to ureteral stricture and are relieved by dilatation of the stricture.

Eisendrath⁷ emphasizes the value of *ureteropyelography* in the diagnosis of ureteral strictures, ureteral kinks, and abnormal insertions of the ureter into the renal pelvis, but points out that great care must be taken in interpreting films in that: (1) The levels at which there is normally a relative narrowing of the ureter may vary considerably, or the narrowing may extend over an unusually large section of the ureter; (2) Well-marked kinking may occur as the result of redundancy of the normal ureter and be associated with no symptoms whatever; (3) A kink may be produced artificially with the opaque catheter and may lead to error if only one picture is taken without later withdrawing the catheter for a distance down the ureter and making a second exposure; (4) Dilatation due to inflammation must not be mistaken for the mechanical dilatation found proximal to a stricture; (5) The appearance produced by a localized spasm must not be interpreted as that due to an actual constriction due to pathological changes in the wall of the ureter; (6) The great variation found in the ureteropyelograms of quite normal individuals must be borne in mind.

W. P. Hogarth⁸ states that pain is present in practically every case of ureteral stricture. It may pass off for a time, but "usually the patient is constantly aware of a tender area in the lower abdomen. On palpation, this tenderness is found to extend up the abdomen along the line of the ureter. On bimanual examination, a tender area corresponding to the lower end of the ureter can be felt, but no mass. Pain is also felt over the sacro-iliac articulation". "Treatment consists in over-dilating all strictures found. Both ureters should be widely dilated; in some cases as much as 16 F. is required. Dilatation may be done by bulbs on catheters or by dilating bougies. Dilatation is done gradually at treatments ten to fourteen days apart. Prompt removal of the focus of infection is also necessary to secure the best results".

In a study of 60 cases of *calculus impacted* in the ureter, A. H. Peacock⁹ applies the term 'impacted' to stones which have failed to move downwards after repeated attacks of ureteral colic. In 48 per cent of the cases no bacteria were

found in the urine collected by ureteral catheter at the time of examination, in 27 per cent staphylococci were present, in 20 per cent staphylococci together with *B. coli*, in 4.5 per cent *B. coli* alone, and in 0.5 per cent tubercle bacilli alone were found. The writer does not think that the absence of bacteria in the urine at the time of examination necessarily excludes a bacterial origin of the stone formation, as a pyelitis may have existed at the time the calculi were formed and may have cleared up subsequently. Whenever the urine is found to be heavily infected with staphylococci, as was the case in 47 per cent of the cases in this series, the presence of a urinary calculus should be suspected. In 20 per cent of the cases there was complete absence of macroscopic or microscopic pus in the urine, whereas in only 6 per cent were red blood-corpuscles absent. The stones were impacted in the upper third of the ureter in 19 per cent, in the middle third in 5 per cent, and in the lower third in 76 per cent of the cases. The youngest patient was 23 years of age, the oldest 70 years, and 65 per cent of the cases occurred between the ages of 30 and 50. In 20 per cent of cases no impairment of renal function was indicated by the phenol-sulphonaphthalein test, whereas in 12 per cent there was total obstruction with absence of renal function, and in 68 per cent definite impairment of function. Excluding any history of the previous passage of stone, it was found that the calculi were solitary in 96 per cent of cases. X-ray photographs were positive for stone in 72 per cent of the cases, the diagnosis in the remainder resting on the clinical findings together with information derived from the use of the wax-tipped bougie and the passage of ureteral catheters. In the present series, dilatation of the ureter with or without ureteral meatotomy or the injection of liquid paraffin was successful in assisting the calculus into the bladder in 50 per cent of the cases. When dilatation fails, the writer recommends extraperitoneal ureterolithotomy, but does not state how many of his cases were submitted to this operation.

R. L. Stewart¹⁰ reports a case of a *primary papillary epithelial tumour* of the ureter, with cyst formation and evidences of early malignancy of a local character, found in a woman 75 years of age. Primary tumours of the ureter are rare, for in addition to the 47 published cases collected by Aschner in 1922, the writer has been able to collect the records of only 5 more in the literature. Associated calculus is not common, being present in 11 of the 53 cases, and when present it is generally associated with malignant forms of tumour. Concomitant anomalies in the ureter were noted on two occasions; in one multiple papillomatous tumours grew in the upper end of a bifid ureter, and in the other a 'papillary epithelioma' occupied a diverticulum at the lower end of the ureter. The writer classifies these tumours as follows: (1) Connective-tissue tumours—sarcoma. (2) Epithelial tumours: (a) benign papilloma, (b) papillary carcinoma, (c) non-papillary carcinoma. The tumours are most frequently papillary in type, when they may occur either singly or as isolated multiple groups or as a diffuse papillomatosis, and have a decided tendency to malignancy. Sarcomata are excessively rare. The non-papillary epithelial tumours are the least commonly found of the epithelial growths, and while most have been described as medullary or encephaloid carcinomata, there are five cases on record of squamous-celled carcinoma. Practically all ureteral growths tend sooner or later to produce mechanical obstruction, so that secondary hydronephrosis is a common concomitant, and may be extreme if the obstruction is of gradual onset and long standing, as is usually the case with the more benign forms of tumour. Early metastasis, by way of the blood-stream not uncommonly to liver and lungs, or by lymphatics to the retroperitoneal lymph-glands, is the rule with the malignant growths. Any portion of the ureter may be involved, but a predilection towards either the upper or lower extremity is

evident. The symptoms are hæmaturia (65 per cent of all cases and over 75 per cent of papillomata and papillary carcinomata) and pain, either as acute colic from the passage of clots, or as a more constant ache in the loin from back-pressure on and dilatation of the renal pelvis, or as severe and sometimes lancinating pain from pressure on or infiltration of important surrounding structures. As an objective symptom, hydronephrosis in varying degree has been observed in approximately 55 per cent of cases, and in a small proportion it has been the sole evidence present of urinary disease, as in a case reported by Thomson-Walker in 1921, in which the diagnosis of diffuse papillomatosis of the ureter was arrived at during an operation for an otherwise symptomless hydronephrosis of eight months' duration in a man who had experienced one attack of hæmaturia four years previously. Diagnosis is usually difficult, but ureteropyelography is of considerable aid. It is of importance to locate the lower limit of the tumour, especially with reference to the possibility of multiple growths. In most instances, nephro-ureterectomy, complete or partial, is the treatment of choice, but fulguration of tumours, when simple, which are situated at the lower end of the ureter, has given encouraging results in patients unsuited for the more radical surgical measures.

C. H. Mayo¹¹ states that *transplantation of the ureters* has been performed in 60 out of 94 cases of exstrophy of the bladder seen at the Mayo Clinic, with an operative mortality of 13.33 per cent. The incidence is only 1 in 50,000 births, but operation is justified by the relief that follows it, and when untreated the mortality is said to be 50 per cent within the first ten years of life. With experience in several methods of operation for the relief of the condition, the writer is opposed to any method of forming a new bladder-sac by using the mucous membrane, skin flaps, or skin grafting. No nervous or automatic control of the outlet can be established, and the more completely the bladder is developed the more dangerous is the condition of the patient. Nor does the writer recommend any form of closed intestinal pouch as an artificial bladder, since it is susceptible to sepsis, has no automatic control, and hence leads as surely to chronic pyelonephritis. The technique of transplantation of the ureters as developed by Coffey is better than that which involves surrounding the ureter with the whole thickness of the bladder, and fails to achieve the 'valve-action' secured by the former method. The writer describes Coffey's technique, with slight modifications as practised at the Mayo Clinic, which permits of pressure on the ureter by pressure of contents of the bowel against the mucous membrane, closing the ureter without interfering with ureteral peristalsis. In nearly all cases urine is absorbed by the bowel for a few days as with the administration of rectal saline by the Murphy drip method; there is, however, almost no absorption from the second ureteral transplant after the ten or twelve days necessary to establish the first tolerance. With only half the urine in the bowel at first, there is less trouble than if both ureters are transplanted the same day. Nearly all cases show some evidence of pyelitis, which, however, soon disappears. Children under four years should not be operated on, as the patients must be old enough to attend to their own clothing and toilet. Within a short period the urine should be retained during the day for from two to four hours, and at night it is usually retained for eight hours. The mucosa of the bladder with that of the ureteral stumps is removed about one or two weeks after transplantation of the second ureter. (See also BLADDER, DISEASES OF.)

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URETHRA, DISEASES OF.

Sir John Thomson-Walker, F.R.C.S.

In a paper on *urethral pouches*, G. P. B. Huddy¹ describes 8 cases, 4 of which were found during the course of routine post-mortem examination, while the remainder came under observation clinically. All were thought to be acquired pouches except one, which was the result of a cystic dilatation of the uterus masculinus, measuring 1.5 by 1.2 cm., and which had given rise to no symptoms. In one case a diverticulum of the penile urethra originating in one of Littre's glands was associated with urethral obstruction, the result of a large scar surrounding and obstructing the external urinary meatus; and in another case a pouch the size of a walnut situated at the peno-scrotal junction was found in association with post-gonorrhoeal strictures of some ten years' standing. The fourth case was that of a woman with a pouch opening on the posterior urethral wall, the cause of which was thought to be injury of the urethra during childbirth. In one of the cases a small pouch developed gradually in the region of the bulb after the operation of external urethrotomy. In the last three cases, in one of which calculi were found in the pouch, no cause could be assigned for the development of the condition, and all three were in connection with the anterior urethra.

The surgical treatment of *pseudo-hermaphroditism* and *hypospadias* is discussed by A. Edmunds² and is arranged in four groups: (1) The glans alone is cleft; such a condition calls for no treatment unless the meatus is constricted. (2) The meatus is situated at some point behind the glans on the body of the penis. (3) The urethra opens at the root of the scrotum, and the penis is generally markedly curved; the anterior part of the urethra is represented by a shallow groove which stands out as a taut band when an attempt is made to straighten the penis; the meatus is often constricted. (4) There is a complete cleft of the scrotum, and the urethra opens in the perineum. These cases are often mistaken for females, especially in infancy. The redundant prepuce is continued down on either side, resembling the labia minora, and a rudimentary vagina may open between the urethra and the anus. The distinction between a male with a cleft scrotum and a female with a hypertrophied clitoris may be very difficult or even impossible in the absence of a microscopical examination of the essential sex glands. If doubt remains, it is wiser to bring the child up as a male. In all four groups the prepuce is cleft on the under surface and redundant on the upper aspect, and the operation described by the writer is suitable for all of them. The best age at which to operate is about four years.

The operation is performed in three stages with intervals of three months between each. The first stage consists in buttonholing the preputial hood, so that the prepuce is partially dissected away from the corona, and a collateral circulation is induced from the sides. Should the meatus be constricted, it should be slit backwards and the mucous membrane and skin united with catgut. In the second stage an incision is made along either side of the urethral groove, the two incisions being joined in front in the substance of the glans. The malformed and contracted urethral channel with its rudimentary corpus spongiosum is now dissected up towards the scrotum and shrinks into a small knob of tissue. The preputial half of the buttonhole is next cut across in the long axis of the penis, with the production of two lateral projections on either side of the glans. The incision which was made to dissect up the urethra is now carried around the corona from the point which would have corresponded to the attachment of the frænum in a normal case, to the centre of the coronal attachment of the lateral projections, leaving about 1 mm. of skin attached to the corona. From the termination of these incisions two others are carried out, one on each side, into the lateral projections,

dividing the skin on the upper surface only. By dissection and stretching the whole length of these incisions is opened up, and in this way an irregular flap is produced on either side of the end of the penis. The two flaps are then brought down to cover the raw surface from which the urethral groove has been dissected up, commencing at the opening of the urethra. The penis is now straight and very considerably broadened. After three months, the third stage is undertaken. A rubber catheter is inserted into the urethra for 2 or 3 inches and fixed to the glans by means of a stitch, so that the catheter now lies along the course of what will be the new urethra. Starting at the scrotal end, incisions are made on either side of the catheter to allow of the formation of two flaps of skin wide enough to meet easily over the instrument, and are joined posteriorly around the urethra. These flaps are sutured over the catheter, and the margins of the skin are sutured together over the raw surface of the flaps which have gone to form the new urethra. The catheter is now removed. The writer has performed this operation upon over twenty cases.

S. McGuire³ reports three cases of hypospadias in which he used a tubular graft composed of the mucous and submucous coats of the vermiform appendix in the formation of a penile urethra, with success in each case. His technique is described in detail.

L. Grimalt,⁴ in four cases of *traumatic rupture* of the urethra, performed primary circular urethrorrhaphy immediately after suprapubic cystotomy. In all cases, complete healing, with a minimum of scar-tissue formation and no tendency to contraction at the site of the anastomosis, was ascertained at a later date by urethroscopy.

C. L. Denning⁵ recommends the *formation of a urethral sphincter* by transplantation of the gracilis muscle in cases of incontinence of urine due to the congenital absence of bladder sphincters or the loss of these muscles as the result of injury. The advantages of using this muscle are: (1) The loss of its normal function does not interfere at all with locomotion; (2) The muscle is easily accessible and has a double nerve-supply; (3) The nerves and vessels supplying the upper portion of the muscle lie so high up, that a long belly of muscle can be turned upwards without in any way interfering with them. The writer describes a case, that of a woman 21 years of age, with epispadias and congenital absence of the sphincters of the bladder, in which the right gracilis muscle was transplanted around the mucous membrane of the urethra. Three plastic operations previously carried out on the urethral canal itself had failed to relieve the incontinence, but a year after the transplantation of the gracilis the patient was found to have complete control of micturition.

Deva⁶ recommends the application of a compress of absorbent cotton-wool soaked in a solution made up of equal parts of adrenalin chloride (0.1 per cent) and cocaine hydrochloride (10 per cent) for about fifteen minutes to the end of the penis, including the strangulating band, in cases of *paraphimosis*. On removal of the compress, it will be found that the oedema has disappeared, and that with a little manipulation the prepuce can be restored to its normal position.

G. P. B. Huddy⁷ analyses the results of 107 cases of *urethral stricture treated by internal urethrotomy*. Suprapubic cystotomy should precede internal urethrotomy if there is evidence of renal insufficiency or marked urinary infection. A peri-urethral abscess when present should be incised and drained, and only after the infection has subsided should internal urethrotomy be performed. Similarly urethral stricture associated with urinary extravasation is best treated by free incision of the area of extravasation, together with perineal drainage of the bladder prior to internal urethrotomy, should the position of the stricture render this necessary. The complications met with

after operation in this series were: Urinary fever: (a) Immediately consequent upon the operation (none in 49 cases, pyrexia of under 100° in 22, pyrexia of over 100° in 28, and rigors in 10); (b) Following on removal of the catheter or on commencing to dilate the stricture after operation (pyrexia in 17 cases and rigors in 12). In no instance was post-operative hæmorrhage of sufficient severity to cause alarm. Right-sided hemiplegia occurred in one case on the fourth day after operation. In one case atony of the bladder was present, but micturition was re-established after a period of regular catheterization. In one case peri-urethral abscess, and in 2 cases epididymo-orchitis, occurred. There was no instance of post-operative extravasation of urine. Two patients died, one twelve days after operation, in whom, on post-mortem examination, the kidneys were found to be hydronephrotic and in a condition of pyelonephritis, whereas the other was found to have a carcinoma of the bladder, vesical calculus, and purulent nephritis, in addition to the urethral stricture. The late results in the 105 remaining cases were as follows: 8 died since discharge, all of whom failed to attend for subsequent dilatation. Of these, 2 died of recurrence of stricture and renal failure, 1 of cystitis and pyelonephritis, 3 from intercurrent affections, and in 2 the cause of death was not determined. Of the remaining 97, 78 have been traced, of whom 44 have continued to attend regularly for instrumentation with excellent results; while of 34 who have not attended, but some of whom have been treated by their doctors, 22 are quite well, 3 have some difficulty, and 9 have no difficulty but the stream is not as 'free' as on discharge.

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UTERUS, AFFECTIONS OF.

Beckwith Whitehouse, M.S., F.R.C.S.

Chronic Endocervicitis and Cervical Erosion.—The pathology and treatment of chronic infections of the cervix uteri form the subject of a series of papers read before the Section of Gynæcology at the 77th annual session of the American Medical Association. C. Jeff. Miller¹ observes that endocervicitis causes more inconvenience to those affected than any other gynæcological condition, and that there is no gynæcological lesion which is the subject of more unsatisfactory treatment. The cause is still far from clear. A large percentage of cases are undoubtedly due to specific infection, which may date back to a childhood lesion so mild that it passed unnoticed at the time. Miller believes that even the so-called congenital erosion represents the result of a former infection rather than a simple physiological overgrowth. The gonococcus is the most common infecting agent: the streptococcus, staphylococcus, and colon bacillus are next in order of frequency. In view of the pathogenic bacteria present in endocervicitis, and of the extensive lymphatic system of the cervix, the cervix uteri is now regarded by many observers as a source of systemic infection. It has indeed been called by Sturmdorf the 'tonsil of the pelvis'. L. M. Moench² has done important work in this connection by reproducing experimentally in animals arthritic lesions by inoculation with serums from the cervical discharge and tissues of patients suffering with endocervicitis. Langstroth has reported a series of fifty patients with nervous and mental conditions who were either relieved or cured by the eradication of a diseased cervix.

Carey Culbertson³ draws attention to the association of cervical erosion and excessive cervical secretion. An erosion is practically never seen in the absence of excessive discharge, and the author considers that its presence is evidence of

excessive secretion. On the other hand, profuse discharges occur in which erosion is not seen, and therefore another factor is also necessary. This factor is the chemical reaction of the vaginal secretion. The normal acid reaction has a wide range of variation, but is not persistently high at any time. Normal equilibrium, however, is markedly disturbed by infection, the discharge becoming alkaline under certain conditions and strongly acid under others. The squamous epithelium of the portio becomes macerated and disappears, to be replaced later by cylindrical cells and glands as a reparative process which appears clinically as a simple erosion.

The treatment of gonorrhœal endocervicitis by means of **Diathermy** is considered by B. C. Corbus and Vincent O'Connor.¹ The authors point out that the application of powerful bactericides and protein coagulants such as silver salts and iodine fail because these remedies coagulate both tissue and bacteria, and therefore do not penetrate to the deeply lying organisms that are responsible for the continuance of the infection. Vaginal douches and tampons also are absolutely useless in treating cervical lesions, and create a false sense of security by easing the patient's mind. A vaginal douche has the same cleansing effect that a bath has to the body; nothing more! Diathermy, on the other hand, offers a scientific and effective means of eliminating the gonococcus from the cervical tissues. This organism, unlike others, is easily destroyed by a temperature that does not affect the life of the normal body-cell. To secure the most perfect results it is essential that attention be paid to certain points. The writers emphasize the importance of only employing an apparatus capable of furnishing a current with a frequency of 800,000 oscillations per second, or a wave length of 375 metres. A suitable voltage is from 7000 to 10,000, but this is of secondary importance to the milliamperage. The writers advise that a single treatment be continued from thirty to forty minutes at a temperature of 116° to 117°. It may, however, extend as long as sixty minutes if controlled by thermometer readings. Treatment is continued until the gonococcus is permanently eliminated from the tissues.

Harvey B. Matthews² calls attention to the advantages of **Cauterization** in the treatment of chronic endocervicitis, especially when employed during the early stages of the condition. He points out that in the majority of cases it can be performed in the consulting-room and does not require anæsthesia! It is primarily a prophylactic measure which, if properly employed, will obviate the necessity of later operation and is very successful when the infection is superficial. In infections of long standing, or when accompanied by lacerations of the cervical tissues, the Sturmdorf 'Cone' Operation appears to offer the best method of treatment. By this means the infected cervical mucosa as high as the os internum is enucleated without the production of any subsequent cervical stenosis. Out of a total of 28 pregnancies after the Sturmdorf operation there were 17 normal labours, 3 had moderate cervical dystocia but were delivered normally, 1 had low forceps, and 6 aborted, the cause, according to the writer, not being found in the cervix.

The advantages of the Sturmdorf operation are further endorsed in a paper by R. W. TeLinde.³ The writer remarks that tracheloplasty by this method is not complicated by the post-operative cervical hæmorrhage which is the common experience of all operators employing the older methods of cervical amputation and trachelorrhaphy.

Syphilis of the Cervix Uteri.—Uterine syphilis is a subject which hitherto has received comparatively little attention; but according to G. Gellhorn,⁴ syphilitic lesions of the cervix occur far more frequently than is generally assumed. Primary and secondary lesions are especially apt to be overlooked because they produce no symptoms. The cervical secretion, however, especially

if secondary ulcers are present, contains spirochaetes and is, of course, highly infectious. Gellhorn comments on the yellow or whitish-yellow discoloration of syphilitic ulcers on the cervix—an important diagnostic sign. The lesions are also usually situated at some distance from the external os. The ulcers are characterized by a sharp outline and the absence of inflammatory reaction of the surrounding mucosa. Tertiary lesions in the form of gummata or gummatous ulcers give rise to bleeding, and in some respects very closely resemble carcinoma cervicis. In fact, uteri have been removed under the impression that the patient was suffering from a malignant lesion. Several interesting and important problems are intimately connected with the subject of cervical syphilis apart from the question of diagnosis. One is the infectiousness of cervical secretions from syphilitic patients. Gellhorn quotes a case in which spirochaetes were present in the discharge from a cervical ulcer, no other lesion being present in the patient. Another point which the writer raises is the transition of syphilis into cancer of the cervix. Gellhorn reports three cases which he thinks illustrate this point. They do not appear to be very conclusive, but are suggestive.

Carcinoma of the Cervix Uteri.—Uterine cancer continues naturally to occupy a prominent position in gynaecological literature, and the advantages of surgical versus radium therapy and vice versa still invite discussion. Victor Bonney,⁵ in a paper on the outcome of 214 Radical Abdominal Operations for carcinoma of the cervix, states that his operability-rate up to 1910 was 63 per cent, but in recent years was more nearly 70 per cent. The operation death-rate where the glands were carcinomatous was 21 per cent. A review of 130 operations after a lapse of 10 years showed an operation mortality of 19 per cent and over 84 per cent of cures among the survivors. The chance of recurrence and cure in cases with carcinomatous glands was as two to one, and of those without gland involvement as two to three. In reaching a prognosis every point has to be considered—e.g., age, physique, state of health, duration of pain and of bladder symptoms, motility of the cervix, involvement of vaginal wall and its situation if present, and duration of bleeding. The most reliable guides are pain, bleeding, and bladder symptoms. A useful rule according to the writer is: 'Three months' bleeding, growth certainly removable; six months' bleeding, possibly removable; twelve months' bleeding, most probably not removable.

Clara Stewart and Matthew Young,⁶ in a statistical study based on the results of radical operations for cancer of the uterus performed in Leeds, state that the immediate mortality-rate from operation was 17·2 per cent in the case of 104 patients; 80·8 per cent survived the operation for three years and 23·1 per cent for five years. The writers found that the proportion of nulliparae amongst the patients with cancer of the cervix was 10·8 per cent, as contrasted with 40·5 per cent in carcinoma of the corpus uteri. The average number of children in patients with cancer of the cervix was 4·86 per cent, a figure which is twice the average number of children borne by patients with cancer of the uterine body.

The first report of the Cancer Research Committee of the London Association of the Medical Women's Federation published by Dr. E. Hurdon⁷ furnishes a clear account of the steps that are being taken by a group of medical women to establish the results of Radium Therapy for uterine carcinoma with a standard technique. The method adopted with certain modifications is that which has been in use for fifteen years at the Radium Hemmet, Stockholm, under the direction of Dr. J. Heyman. At this clinic the absolute cures in 375 inoperable cases of cancer of the cervix are stated to be 20·29 per cent, the primary mortality being only 1·19 per cent. The methods employed under

the direction of Dr. Hurdon are as follows: Two tubes of radium, in tandem, are inserted into the cervical canal. Flat applicators are also placed in the lateral or antero-posterior vaginal fornices in contact with the growth, being kept in place by a gauze pack; 50 mgrm. radium element are placed in utero, and 50 to 70 mgrm. in the vagina. The length of time for each application is twenty-two hours, and three applications are made; the second takes place one week after the first, and the third two weeks after the second. The report deals with 42 cases, of which 6 were operable. The author observes correctly that the early disappearance of local signs is in accordance with general experience and cannot serve as a basis for an optimistic prognosis. The difficulty in treating cervical carcinoma by means of radium has hitherto been concerned with extension of the growth beyond the influence of the radium element. It is true that the general policy of British surgeons in the past has been to reserve radium applications for clinically inoperable cases, in the belief that wide surgical excision gives better results. For this reason it is possible, and indeed probable, that radium therapy has hardly been given a fair chance, and therefore the further reports of an organization which has had the courage to treat a certain number of operable cases on a conservative basis will be awaited with interest.

Two other points are deserving of special mention amongst the general remarks which the writer makes in her report. One is a reiteration of the statement, so commonly noted, that the majority of the patients did not seek advice until the disease was far advanced. The other and more surprising observation is that in more than 25 per cent of cases the average time elapsing after consultation before a vaginal examination was made was seven months!

Grant E. Ward,⁸ discussing the technique and latest results of radium treatment of cervical carcinoma in the Howard A. Kelly Hospital, Baltimore, observes that radium is of great value in cases which are hopeless from the standpoint of operation. In the last series of 141 cases of this type, 10 per cent were clinically cured on a five-year basis, 28.3 per cent showed healing of the primary growth, and 44.4 per cent were improved. A clinical cure had been realized in 20.2 per cent of a total of 232 cases treated, including all classes of case—operable, operation after radium, recurrent after operation, prophylactic after operation, borderline, radium and cautery, and inoperable.

Röntgenotherapy as opposed to radiotherapy is considered by H. Coutard and C. Regaud,⁹ who report the results in 2 patients after hysterectomy and in 29 inoperable cases. Amongst 9 patients treated exclusively with X rays, recovery occurred in 44.4 per cent. X rays followed by radium induced recovery in 33 per cent of 10 patients. In the case of 10 others, however, who were treated with X rays after radium had failed, no cure is noted.

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VACCINATION.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—In view of the false statements circulated that vaccination may cause *syphilis*, M. W. Ireland, Surgeon-General United States Army, E. R. Stitt, Surgeon-General United States Navy, and H. S. Cumming,¹ Surgeon-General United States Public Health Service, have issued a manifesto containing the following statistics. Since 1917 the United States Army has vaccinated approximately 4,700,000 and the United States Navy approximately 950,000 members of their personnel without a single one of

these 5,650,000 developing syphilis as the result of vaccination. During the same period the United States Public Health Service also vaccinated 2,918,748 persons in the course of quarantine, immigration, and hospital work. While the Public Health Service has not always had the opportunity of following up these vaccinations as carefully as the Army and Navy, no one has ever alleged that any individual vaccinated by the Public Health Service has contracted syphilis as the result of vaccination. During the past ten years more than 2,000,000 persons, including school children, have been vaccinated by State and local health authorities in co-operation with the United States Public Health Service, making a grand total of 10,568,748 recorded by the Government Medical Services, without any allegations having been received that any particular individual of this number had contracted syphilis as the result of vaccination. In this connection reference may be made to A. Hauswirth's² report of the results of an inquiry into the alleged evil effects of vaccination by a Committee at Berne on the occasion of compulsory vaccination in 1922-24 during the epidemic of small-pox in that country (see MEDICAL ANNUAL, 1927, p. 458). The Committee consisted not only of two doctors, one of whom was Hauswirth in his capacity of Medical Officer of Health for Berne, but also three laymen, one of whom was an anti-vaccinationist. Among 40,000 persons who had been compulsorily vaccinated between the spring of 1922 and the autumn of 1924, only 14 cases of supposed ill-effects were reported to the Committee, who after careful consideration decided that there were only 4, 3 of which were fatal, in which the possibility of a connection between the disease and the previous vaccination could not be excluded. The 3 deaths were due to septic processes in which the onset of the disease probably coincided with the performance of vaccination. The case which recovered was one of encephalitis. Thus in only one out of 10,000 vaccinations could any evil effects be attributed to vaccination.

J. A. Urner³ reports the results of vaccination of 129 *pregnant women* and 200 *new-born infants*. The period of pregnancy ranged from the 12th to the 39th week; 66 were vaccinated from the 8th to the 10th month, and their infants reacted with 66 per cent positive vaccinations; 63 were vaccinated from the 1st to the 9th month, and their infants reacted with 71.5 per cent positive vaccinations. Only 5 per cent of the women successfully vaccinated showed rather severe symptoms, but there was not a single case of threatened abortion, miscarriage, or premature labour. Newborn infants stood vaccination well, and even better than older children. None showed exanthemata or other generalized reactions. In no instance could intra-uterine transmission of immunity to small-pox or vaccination be demonstrated.

From observations of 874 *vaccination cicatrices*, J. P. Leake and S. Thomas⁴ conclude that the size of the scar, its character (whether pitted or smooth), and amount (whether marked or faint) has no practical bearing on a person's immunity against vaccinia or variola.

R. von den Steinen⁵ records a fatal case of *generalized accidental vaccinia* in a hitherto unvaccinated child, the subject of chronic eczema, who became infected by sleeping in the same bed with his recently vaccinated younger brother. The chronic eczema provided not only a wide portal of entry for infection, but also the most favourable medium for the further growth of the vaccine virus. The hitherto dry eczema became moist, and in the course of four days the vaccinia became generalized through the blood-stream, and a follicular tonsillitis developed, indicating severe involvement of the lymphatic system. The general condition became worse, and death from bronchopneumonia ensued. The patient's sister, age 6 months, also had an attack of generalized vaccinia originating in eczema vaccinatum, but recovered. Von

den Steinen recommends that greater care should be taken in refusing to vaccinate children if they themselves or their brothers and sisters are suffering from dry eczema. The rarity of generalized vaccinia is shown by the fact that since 1912 only one case has occurred in every one and a half million vaccinations performed yearly in Prussia, with a mortality of 20-25 per cent, so that there was only one death from generalized vaccinia every four or five years.

The occurrence of *tonsillitis* after vaccination, first described by Orgler in 1922, is discussed by G. Koch,⁶ who found the earliest date for its appearance was the sixth day after vaccination, and that it subsided in two or three days, its occurrence bearing some relation to the development of the vaccinal lesions.

H. M. Turnbull and J. McIntosh⁷ report 7 fatal cases of *encephalomyelitis* following vaccination in patients of ages from 7 to 22, which have come under their notice since 1912. The histological changes in the central nervous system were allied to those of poliomyelitis and encephalitis lethargica, but showed characteristic differences. The clinical picture was also peculiar. Although the cases were fatal, the writers remark that complete recovery is the rule in cases which survive. (*See also* MEDICAL ANNUAL, 1927, p. 513.) The only virus demonstrated experimentally in the tissue of the brain and cord was a vaccinal virus. Experiments did not prove this virus to have neurotropic properties of exceptional intensity. Vaccinal encephalitis can be caused experimentally in rabbits (A. Marie, 1920; C. Levaditi, P. Harvier, and S. Nicolau, 1922). The possibility of a similar encephalitis in man is suggested by its occurrence in the closely allied condition of variola, in which the histology of the encephalitis appears to be very similar to that of encephalitis following vaccination.

F. Lucksch⁸ points out that the nervous sequelæ of vaccination are sufficiently distinct both clinically and pathologically to be regarded as a special form of disease under the name of *meningo-encephalitis* or *myelitis vaccinica*. Three groups of those sequelæ may be distinguished according as they affect (1) the meninges alone, (2) the brain and meninges and occasionally the spinal cord as well, (3) the spinal cord only. In the meningitis following vaccination the cerebrospinal fluid is clear, and there is an absence of pleocytosis, increase of albumin or sugar, or formation of a clot after the fluid has stood for some time. On the other hand, all these phenomena are present in the meningitis of epidemic encephalitis. The chief clinical differences between epidemic encephalitis and the encephalitis following vaccination are that the latter is characterized by the absence of ocular palsies, the presence of Babinski's sign, the occurrence of symptoms of tetanus, the frequency of vesical and rectal disturbances, and the complete disappearance of all the symptoms in cases which survive.

REFERENCES.—¹N. Y. *State Jour. Med.* 1927, 374; ²*Schweiz. med. Woch.* 1926, 1113; ³*Amer. Jour. Obst. and Gyn.* 1927, xii, 70; ⁴*Jour. Amer. Med. Assoc.* 1926, lxxxvi, 1124; ⁵*Jahrb. f. Kinderheilk.* 1926, cxiv, 193; ⁶*Deut. med. Woch.* 1927, 148; ⁷*Brit. Jour. Exper. Pathol.* 1926, vii, 181; ⁸*Centralbl. f. Bakteriol.* 1927, cii, 222.

VAGINAL DOUCHING.

Beckwith Whitehouse, M.S., F.R.C.S.

Since the time of Hippocrates, the vaginal douche has been a common item of pelvic therapeutics. As pointed out, however, by S. R. Meaker,¹ as a rule neither patient nor physician has a very clear idea of its proper uses and its limitations. In selected cases douching certainly accomplishes definite good, but as commonly practised it is, according to the writer, for the most part worthless, if not positively harmful.

Douches may be used for three specific purposes—(a) simple cleansing, (b) local medication, and (c) hydrotherapeusis. As a general rule the cleansing

douche is either unnecessary or inadequate, and it is important to remember that by interfering with the normal vaginal secretions a douche may remove the natural defences of the tissues and defeat the very purpose for which it is used. A properly fitted pessary is not an indication for constant douching, and in the words of the author, "a healthy woman has no greater need of a daily cleansing douche than she has of a daily gastric lavage".

Medicated Douches depend, of course, for their effect upon the action of some drug, commonly an antiseptic. In the great majority of cases in which antiseptic douches are prescribed the indication is stated to be leucorrhœa. Now the most common cause of leucorrhœa is an endocervical infection, and this being deep-seated is entirely out of reach of any vaginal application. It follows therefore that such douches can only possess a temporary cleansing value. **Alkaline Douches**—e.g., sodium bicarbonate—are useful for washing away tenacious mucus as a preliminary to operation or other therapeutic measures. They are also of value in some cases of pruritus vulvæ associated with an excessively acid vaginal discharge. **Acid Douches**—e.g., boric acid—may be employed when the vagina is invaded by bacteria which flourish in an alkaline medium as in the vulvovaginitis of children and old age. Medication on these lines, however, is better effected by means of insufflation with powder than by solutions, the effect of which is but transient.

The writer, in discussing the value of the **Astringent Douche**—e.g., zinc sulphate, alum, or tannic acid—is frankly sceptical as to the 'toning up' by these agents of relaxed and weakened tissues. **Hydrotherapeutic Douches** at a temperature between 105° and 115°, lasting at least twenty minutes and employing a volume of 8 to 12 quarts of water or physiological sodium chloride, are far more efficacious. Meaker considers that a long hot douche of this type is one of the most valuable of minor therapeutic measures in gynecology. It has a wide range of application, and is indicated in all disorders in which chronic passive congestion is a feature. In chronic inflammation of the pelvic organs the depleting douche relieves pain, limits the spread of inflammation, and helps in the absorption of exudate.

In prescribing douches of any type the physician should be most explicit about details, the importance of which the patient rarely appreciates. A douche can or bag ought always to be used, as satisfactory results are not obtainable with the ordinary bulb-syringe apparatus.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1926, Oct. 23, 1377.

VARICELLA. (See CHICKEN-POX.)

VARICOSE VEINS AND ULCERS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The **Injection Treatment** of varicose veins has met with increasing favour by those most competent to judge. The thrombus produced after injection becomes so firmly adherent that embolus is unlikely as a complication. The patient may be put sitting on a table with the legs hanging over, or, better still, standing on a chair. The big veins will often be found on the inner aspect of the legs just below the knee-joint. A fine short hypodermic needle is introduced, and a little blood aspirated to make sure that the needle is *in situ*. The patient may then lie down before the injection is made. The next injection is given two days later. The only complication to guard against is the escape of fluid outside the vein; this may cause sloughing and troublesome ulcers. Varicose ulcers heal rapidly after successful treatment of the veins.

Higgins¹ deals with this subject. He points out that obstruction in the deep veins, is of course, an absolute contra-indication, just as it would be in the case of excision. He recommends **Sodium Salicylate**, as used by Sicard, in strengths

of 20, 30, and 40 per cent. The ampoules are made up by Bell and Croyden, Wigmore Street. Each ampoule contains $2\frac{1}{4}$ to $2\frac{1}{2}$ c.c. The solution should be colourless: if there is any violet tinge it indicates decomposition. The first dose used is 2 c.c. of the 20 per cent solution. Three or four days after injection the patient returns, and the degree of reaction, i.e., local tenderness and thickening, is noted. Unless this has been extreme, the 30 per cent solution is used on the second occasion, probably in two places. Sicard insists on increasing the strengths and quantity of the injections as rapidly as possible. The maximum dose at one sitting should never exceed 6 c.c. of the 40 per cent solution. The patient stands on a steady chair, grasping the back. Where the veins are sufficiently obvious the injections are made with the patient recumbent. Higgins avoids injecting thin-walled pouches, and, unlike others, he begins below and works upwards. A 3-c.c. glass syringe with a very fine hypodermic needle is employed. The needle attached to the syringe is thrust boldly into the vein. Blood immediately flows back into the syringe. The solution is injected slowly, and about twenty seconds are allowed to elapse before withdrawing the needle. Following the injection there is no need for the patients to curtail their activities. [The reviewer thinks that advanced cases should still be treated by surgery, but he has had considerable success in localized varicosities by the injection method. He uses 5 c.c. of a 20 per cent Sodium Chloride solution, as recommended by McPheters.²—W. I. de C. W.]

In the face of growing enthusiasm for the treatment by injection of varicose veins of the leg and of hæmorrhoids, it is well to consider a recent report by Lomholt.³ A man, age 60, who had dilated veins of the left leg, was treated at short intervals with five injections of 5 c.c. each of a 20 per cent sodium chloride solution. Large thrombi formed immediately and the general condition improved. A few days later the saphenous vein was thrombotic up to the fossa ovalis. Two weeks after the treatment, the condition resembled phlegmasia alba dolens. The heart became irregular and the pulse rapid and small. Symptoms of pulmonary embolism developed, with dyspnoea and severe palpitation. The patient overcame the attack, but about one month after the injection treatment he died suddenly of embolism of the pulmonary artery. Lomholt says that only one similar case is reported in the literature, and in that case the embolism was traced to infected hæmorrhoids. One case proves nothing, but, the *Journal of the American Medical Association* remarks, one disaster is an indication for caution.

Varicose Ulcers.—J. Byrne⁴ discusses the cause and cure, and gives notes on the associated pain and pupil inequality. With regard to the latter, he says that the pupil inequality accompanying varicose ulcer has a mechanism similar to that associated with other somatic lesions. He calls the phenomenon pseudo-paradoxical. He draws attention to the fact that lesions of the left lung or of the aorta or left heart, affect the left pupil, and vice versa. The pupil phenomenon and the pain and tenderness in any given case are closely related, the fundamental factor in both being the same, that is, injury, mechanical or chemical, of the primary pain-bearing neurones. Study of the pain and pupil changes occurring in leg ulcers helps to a better appreciation of the sensory and pupil phenomena found in cardiac and other visceral disorders.

Cannon and Lowenfish⁵ treat varicose ulcers of the leg as follows: After injection of the veins with Sodium Salicylate, the ulcer is painted with a 3 per cent solution of Iodine, a sterile gauze dressing is applied, and, beginning over the instep, the entire leg is bandaged with 2-inch gauze soaked in a warm solution of Unna's Gelatin Glue. The composition of this glue is: zinc oxide 1000 grm., gelatin 600 grm., glycerin 1400 c.c., distilled water 2200 c.c. As the leg is encircled with the bandage, an assistant paints it with the glue, using

a 2-in. (5 cm.) paint-brush. The cast may be left on for one or two weeks, being changed only when soaked with secretions from the ulcer, or when the patient complains of undue pressure. They do not advocate cutting a window in the bandage when it becomes wet with secretion, since this removes the uniform support to the parts which is so necessary to the healing of the ulcer, and often results in it becoming necrotic or covered with a greenish slough. Injections are usually made into the veins about once a week, or whenever the casts are changed. They may be made into a single vein in several different locations, but usually not closer than 3 in. (7.6 cm.) apart. They have administered as many as fourteen injections into one leg at a sitting. The number of treatments varies from one to seven, and the total quantity of the injected solution from 0.5 to 25 c.c. Only moderate pain is present at the time of injection, and it entirely disappears in from one to three minutes. They have not noted any constitutional symptoms, nor has there been a case of embolism.

G. F. Stebbing⁶ states in a note on the application of **Unna's Paste**: Zinc and gelatin paste of the B.P.C. (commonly called Unna's paste) is often wrongly applied. The container should stand in water just warm enough to melt it (about 100° F.), and a bandage 3 in. wide prepared of a roll of white gauze four layers thick, or of soft crinoline quite free from starch or dressing. The ulcer to be dressed should be clean, and the skin around should be washed and dried by a spirit lotion which should be allowed to evaporate. The part to be covered should then be painted with a thick coat of the jelly, by means of a brush or cotton-wool swab, and immediately covered by a single layer of the bandage, which must be evenly and firmly applied. It should be applied firmly enough to make the jelly bulge through its interstices, and to avoid creases and ridges in the bandage it may be cut into lengths as often as necessary as it is bound on. Another thick coat of jelly is applied, and then another layer of bandage, until about six layers are in position. Nothing should be allowed to touch the dressing until it is firmly set. It may then be covered with a light bandage, unless the patient is going to wear a crêpe bandage or elastic stocking over it. To remove the dressing it should be saturated with warm water.

A. L. Vischer⁷ advises the use of fine needles with short bevelled points for the injection of varicose veins, and a new needle should be used for each injection. He states that the treatment is very successful, although a relapse is by no means out of the question.

REFERENCES.—¹*Clinical Jour.* 1927, June 22, 289; ²*Surg. Gynecol. and Obst.* 1927, Oct., 541; ³*Abstr. Jour. Amer. Med. Assoc.* 1927, May 14, 1571; ⁴*Amer. Jour. Med. Sci.* 1926, Oct., 553; ⁵*Arch. of Dermatol. and Syph.* 1927, June, 647; ⁶*Lancet*, 1927, 1, 886; ⁷*Ibid.* 223.

VASCULAR SURGERY. (See also ANEURYSM; HEART, WOUNDS OF; VARICOSE VEINS AND ULCERS.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

Hæmorrhage.—In cases of severe hæmorrhage—for example, gastric or renal—the reviewer has found that a combination of remedies will often be successful in obstinate cases; thus 20 to 30 c.c. of normal **Horse Serum** are injected into the recti muscles, and 15 c.c. of a 30 per cent solution of **Sodium Citrate** into each buttock. **Morphia** is administered hypodermically; 5 c.c. of **Calcium Chloride** (10 per cent) is given intravenously for three days. Most cases will be controlled for a sufficient time to find the source and treat the cause either by active or other measures. If the hæmorrhage is alarming, these remedies should be supplemented by a **Transfusion** of 500 c.c. of blood administered very slowly.

B. Gordon and A. Cantarow¹ draw attention to the use of **Parathyroid Extract**. In this there appears to be an agent which can effectively and consistently increase the amount of calcium in the circulating blood. A decrease in the clotting time of the blood commences about four hours after injection. Hæmoptysis was effectively controlled in the majority of instances following the subcutaneous administration of from one to five doses of 10 to 15 units of parathyroid extract every thirty to thirty-six hours. When administered pre-operatively in jaundice it reduced the coagulation time of the blood to within normal limits. Large doses and prolonged use of the extract appeared to increase the amount of bleeding. The most favourable results followed the administration of from 10 to 15 units every thirty-six hours for one to three doses.

Peri-arterial Sympathectomy.—E. G. Slesinger² states that there is a measure of agreement that vasomotor nerve-fibres, both afferent and efferent, are present in the perivascular nerve plexus, and the idea with which sympathectomy has usually been performed is that by dividing the plexus on the main artery, the vasoconstrictor supply to the rest of the distal portion of the limb will be divided, vasodilatation will result, and the circulation of the distal part of the limb will be improved. This idea assumes that the vasoconstrictor fibres run their whole course with the vessel, a view which has little anatomical or physiological evidence to support it. On the other hand, it must be accepted that certain definite changes do undoubtedly follow the operation of peri-arterial sympathectomy in the diseased human subject. The reports of a great number of cases record that pain is very frequently relieved by the operation. Clamping or ligaturing an artery is a painful operation. The pain that accompanies the lodgement of an embolus is another example of arterial pain. Slesinger suggests that the fibres subserving the painful sensation in the vessel walls run in the perivascular plexus. After removal of 1½ or 2 in. of the adventitious coat of the main artery, the tissue removed can be subjected to microscopic examination and it can thus be proved that the actual nerve plexus has been removed. Langley demonstrated that the course of the vasoconstrictor fibres was with the spinal nerves, from which branches join the artery at intervals. It is clear from this that the only situation in which the actual vasoconstrictor fibres can be surgically interrupted is at the sympathetic ganglia. In the leg, the lumbar ganglia have been removed, and in the arm the stellate ganglia. Adson (Mayo Clinics, 1926) reports satisfactory results from this operation in Raynaud's disease. In discussing results, Slesinger thinks that the most uniform success follows sympathectomy in so-called senile cases, though many of these would seem to be in reality arteriosclerotic gangrene. In almost all cases there is marked relief from pain. Slesinger failed in two cases, apart from the relief of pain; the reviewer has had a similar experience. The operation of sympathectomy should be tried in most cases before more severe measures are considered in cases of gangrene or impending gangrene.

[The reviewer has had a fairly wide experience of the operation of sympathectomy in the Ministry of Pensions Hospital, Blackrock. The operation was tried in many cases of painful disturbances in the extremities and following wounds to the main vascular or nerve supply of the limb. It has been tried in true Raynaud's disease and in thrombo-angiitis obliterans. Beyond the relief of pain, little success followed sympathectomy in these latter conditions. Sometimes very marked success followed the operation in other cases. The progress of gangrene was apparently cut short many times. Violent causalgia produced by injury of the ulnar nerve has been temporarily cured. The symptoms recurred within two months in one case, and were relieved by division of the ulnar nerve with immediate re-suture. Peri-arterial sympathectomy

sometimes determines the healing of a chronic ulcer in the lower third of the leg. The operation is simple but must be thoroughly performed. A little saline sponged over the exposed artery stains in a fashion the sympathetic plexus and differentiates it from the true outer coat of the artery.—W. I. de C. W.]

R. Leriche and R. Fontaine³ found that there was sterilization of infected wounds and chronic ulcerations after peri-arterial sympathectomy. Within a few days sympathectomy is followed by an absolute sterilization of chronically infected wounds, provided, of course, that these wounds are not in contact with foci of osteitis, or that they do not contain foreign bodies. The experiments carried out by these writers are most impressive. They proved conclusively that from the fifth to the thirteenth day, the absence of germs in the wound is a constant fact. There are no more microbes, neither on direct examination nor by culture. The slides only show numerous polymorphonuclear leucocytes and normal large mononuclear cells. The following blood-count is of interest :—

	R. B. C.	Leucocytes
Soon after peri-arterial sympathectomy	5,775,000	9,633
At the end of the operation (during the period of vaso-constriction)	3,810,000	3,876
The day following operation (after establishment of vaso-dilatation)	6,035,000	9,000

In one patient, who had undergone a simple section of the sympathetic chain, the cells, which had numbered 6933 before the operation, numbered 11,600 the evening of the operation (while the arm was burning and had become very hot, hyperthermia of 3°). In taking advantage of the aseptic state brought about by the sympathectomy, one may be sure that grafts will take well, and, in this way, one may very quickly make sure of a complete cure of ulcers dating from ten to fifteen years, the graft being done ten days after the sympathectomy. The results thus obtained are very encouraging. It must be understood, of course, that the writers only applied this method to ulcerations which had previously been treated by antisyphilitic medications and which did not depend on underlying varicose veins. There had only been question of ulcers consecutive to burns, traumas, or phlebitis.

[The reviewer has performed sympathectomy as thoroughly as possible in various cases, and is struck with the want of uniformity in results. Sometimes the effect was dramatic and lasting, at other times there was temporary improvement, and then again many results were disappointing.—W. I. de C. W.]

Embolectomy.—From time to time dramatic results have been published of the operation of removing a thrombus from a vessel at a time when the vitality of the limb was in grave danger. For the success of the operation, rapid decision is necessary, and the result depends upon a high degree of technical skill. Nystrom⁴ states that in more than one-third of the cases of embolectomy for impending gangrene of the extremities, the operation had a favourable result. In cases of emboli at the bifurcation of the aorta or in the common iliac artery, laparotomy is associated with great risk. It is better to try and 'milk' the embolus down retroperitoneally into the femoral artery, from which it can be removed by arteriotomy. One case recorded by Nystrom, a woman of 64 years, had heart disease and emboli in both femoral arteries in the groin. The emboli were removed by an arteriotomy performed directly over them. The circulation was restored and the patient survived. Most of the cases operated on by Nystrom were elderly. In these cases both conservative treatment and amputation are unsatisfactory, and embolectomy should be considered in an early case if the site of the obstruction can be located.

Thrombo-angitis Obliterans.—The reviewer⁵ calls attention to the fact that this disease is by no means confined to the poor male adult Jews who

have migrated from Russia to America or elsewhere. For no ascertainable reason some inflammatory condition arises in the deep vessels of the extremities, usually the legs, ending in thrombosis and obliteration, as the name implies. At the onset there may be no clinical evidence of the existence of such a condition, but as time goes on—weeks, months, or years—the organization of the inflammatory products proceeds, until finally local syncope and death may supervene. When a point is reached at which the circulation is at a minimum, and a struggle is taking place to maintain the vitality of the part, the pain often becomes unendurable, and, sooner or later, in a number of cases amputation becomes inevitable for the relief of pain or the spreading of gangrene. The condition is pre-senile, it is non-syphilitic, and is not embolic in origin. The disease of the arteries may be accompanied by thrombosis of the veins. There is an attempt by Nature to provide a new circulation either by collateral anastomosis or by the canalization of the thrombosed blood-vessels and connective tissues. There is a tendency to periodic relapse. The diagnosis can be made more by a process of exclusion than by anything tangible or concrete. Intermittent pain in the calf of the leg is sometimes an early sign. An angry red colour of the foot when allowed to hang, together with puffy toes, is a constant sign when the disease is well established. Trophic lesions may be the first sign, and there are acute cases in which gangrene very rapidly develops. Early and obscure cases have been treated in error for rheumatism, for gout, and for flat-foot and other orthopædic conditions. A careful search should be made for pulseless vessels and for the alternate redness and blanching on lowering or raising the foot.

The question of treatment can only be discussed in a general way; it depends upon the acuteness or chronicity of the individual case. Many authorities speak of low amputations; the writer is convinced that, if amputation becomes necessary owing to the severity of pain or the onset of gangrene, the site of selection is above the knee. Low amputations have been occasionally successful, but the risk of failure is too great. In one case seen by the writer, more than thirty low amputations had been performed on both legs and both arms; the fingers, hands, toes, feet, legs being amputated bit by bit at intervals. The man is still alive. In this case the man was a sailor of British birth. In a second case of acute thrombo-angiitis obliterans the patient was an officer, age 28, also of British birth, who had been serving in the East. Peri-arterial sympathectomy was tried on both these cases without success. In *chronic cases* conservative treatment has met with some success. (*See also THROMBO-ANGIITIS OBLITERANS; also MEDICAL ANNUAL 1927, p. 489, and previous numbers.*)

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1927, April 23, 1301; ²*Guy's Hosp. Rep.* 1927, April, 151; ³*Ann. of Surg.* 1926, Nov., 625; ⁴*Abstr. Surg. Gynecol. and Obst.* 1926, Nov., 415; ⁵*Brit. Med. Jour.* 1927, i, 225.

VINCENT'S ANGINA. (*See PHARYNX, DISEASES OF.*)

VITAMINS, THE PRESENT POSITION OF.

Ivor J. Davies, M.D.

Fourteen years of study by many investigators, mainly in England and America, have fully established the importance of vitamins in medicine, and has proved beyond doubt the existence of at least three varieties, although their chemical constitution has not been determined. All observations support the view that they are formed in the tissues of plants, whence they pass into the herbivora and thus afterwards become available for carnivora. Man when his diet is natural and varied obtains a sufficiency of the vitamins, and it is only when they become artificially separated that a state of avitaminosis may be possible.

The antiscorbutic function of lemon-juice was known to the British Navy

as early as 1800, while the antineuritic factor found in the husks of rice grains and in barley was demonstrated in the Japanese Navy towards the end of the nineteenth century. Almost at the same time Eijkman found that avian polyneuritis had much in common with human beri-beri. He proved that his birds could be rapidly relieved of their symptoms if a little of the outer husk of the rice which had been removed in the process of polishing was added to their diet. In 1906, Gowland Hopkins found that milk contained a growth-promoting factor, and that the addition of quite small quantities to the diet of experimentally-fed animals resulted in a growth which afforded striking contrast to that of the controls. McCollum and Davies, and Osborne and Mendel, reached the same conclusions in America.

The vitamins are designated by the letters A, B, C, etc. A is the fat-soluble, possessing growth-promoting properties, and is necessary for all young animals. In this fat-soluble group, an antirachitic and an antisterility substance have been found, called D and E respectively. B is water-soluble and possesses antineuritic and growth-promoting properties. C is water-soluble and is antiscorbutic. It has already been mentioned that the animal world is almost entirely dependent on the vegetable world for its supply of vitamins. Drummond and Zilva have traced the origin of the vitamin content of cod liver oil to the small plants, the diatoms, which grow on the surface of the sea, and which, abounding in chlorophyll, in the presence of sunlight form vitamins. These diatoms are digested by minute fish which are eaten by larger fish such as the herring, which in turn are eaten by the cod.

Vitamin A: the Growth-promoting Fat-soluble Vitamin.—In 1857 David Livingstone described a peculiar eye condition that he found in his party when they were confined to a diet of coffee, manioc roots, and corn meal: "The eyes became affected, as in the case of animals fed in experiment on pure gluten or starch". Mori, in 1904, was the first to describe xerophthalmia to be the result of a deficient diet. He found that the administration of cod-liver oil was followed by a rapid relief of the eye condition. McCollum and Simmonds observed a similar form of ophthalmia in rats that had undergone periods of faulty dietary. They found the ophthalmia to occur only in animals whose diets were deficient in vitamin A. Xerophthalmia is to-day regarded as the most characteristic sign of a lack of vitamin A. Cramer, in 1924, published an account of the eye epidemics occurring in various industrial schools in this country since 1880. In many of the outbreaks the non-contagious character of the epidemic was the outstanding feature. It seems now probable, although at the time it was thought unlikely, that these cases were showing effects of vitamin A deficiency. Mori, who has made an exhaustive study of the pathological change in the eyes of rats suffering from vitamin A deficiency, concludes that the primary change is a loss of secretion from the lachrymal gland, and that the inflammatory changes in the conjunctiva and lids are secondary. Mori also observed that the salivary glands of these rats showed shrunken acini and no active signs of secretion. Cramer noted that coincident with the onset of xerophthalmia there is a commencing atrophy and necrosis of the intestinal villi. He affirms that the vitamin A has a specific stimulating effect on the intestinal mucous membrane.

In 1913 it was established by McCollum and Davies that certain fats had qualities not possessed by other fats. They showed that butter-fat and the fats of egg-yolk contain something essential to the nutrition of the rat, which could not be supplied by including lard or olive oil in the diet. Osborne and Mendel confirmed these observations, and called attention to what they believed to be an 'infectious eye disease' which was relieved by the administration of the 'growth-promoting fats'.

In young animals deprivation of the vitamin is followed by a cessation of growth which eventually results in death. At what period growth ceases depends on the nature of the previous diet and its vitamin content. Once the vitamin storage of the body is exhausted (the body has a far greater storage capacity for vitamin A than for B or C) growth ceases. While growing rats deprived of vitamin A immediately show signs of the deficiency, adult rats remain healthy for several months. Ultimately they show signs of impaired nutrition and become more susceptible to bacterial infection.

Drummond, Channon, and Coward, by the fractionation of the non-saponifiable residue of cod-liver oil, found the active fraction to consist of an unidentified unsaturated alcohol with a molecular weight of about 300 and an iodine number of about 103. Takahashi, who has claimed to have isolated vitamin A (which he calls *biosterin*), has, it is thought, succeeded in separating one of the fractions, and this fraction contains the vitamin in a concentrated amount.

Recently Drummond and Rosenheim have developed a delicate colour reaction for the presence of vitamin A by the addition of 1 c.c. of pure arsenic trichloride to 1 drop of cod-liver oil, and shaking the test tube. An ultra-marine-blue colour develops which in the course of a few seconds becomes purple and then fades. The reactions that are known to destroy the vitamin, such as oxidation, also destroy the substance which gives the colour reaction. They regard the test as specific for vitamin A, and as possibly a means of distinguishing the growth-promoting factor from the antirachitic factor.

Vitamin B is widely distributed, being present in all natural foods. Yeast and the germ of wheat are the richest sources of this substance. Polished rice, white wheat flour, degerminated corn meal, corn grits, and sugars are, of course, devoid of any vitamin B. Seidell has prepared a concentrated preparation of vitamin B, by taking advantage of the fact that fuller's earth exerts a selective adsorption for this substance as well as for alkaloids. From such preparation Seidell has prepared a picrate of extraordinary potency. Nothing is yet known of the chemical constitution of vitamin B.

Beri-beri is mainly confined to rice-eating peoples in tropical countries. In modern European life under normal conditions, the risk of these deficiency diseases, although a real one in infants, may be regarded as non-existent for adults. The variety of food ensures a sufficiency of these vital factors.

The discovery of avian polyneuritis was an important step towards the elucidation of the human disease. Eijkman, while Medical Officer to a prison in Java, noticed that the poultry of the establishment showed paralytic symptoms closely resembling those seen in his patients. He found on inquiry that the diet of the birds was the remains of the patients' diet.

Vitamin B has been detected in almost all the natural foodstuffs. Its presence in yeast, a unicellular organism, is significant of the universality of the distribution. Its principal sources, apart from yeast, are the seeds of plants and the eggs of birds. White flour contains no appreciable vitamin content; low-grade flour and bran are about twice as rich as the unmilled grain. Eggs are a valuable source, and this property was found unimpaired in two samples of dried hens' eggs. These large deposits of antineuritic factors in the seeds of plants and eggs of animals suggest that provision is made for the wants of the young offspring during the early period of life. Vidder remarks on the prevalence of beri-beri among pregnant women in countries where the disease is endemic. Yeast is rich in this vitamin, which is unaffected by autolysis and extraction. Meat is deficient in vitamin B content, and fish gives no protection to pigeons. Of the fruits, tomato is the most rich in content, roughly about half that of yeast. The mushroom is also a good source of this

vitamin. The content of milk is uncertain, and no uniformity has been obtained in experiments. This content may vary, of course, with the diet of the cow.

The anti-beri-beri factor withstands desiccation for a prolonged period, and the resistance to heat is also considerable. It is much more stable at high temperature in acid solution, but becomes unstable in alkaline solution.

"The practical conclusion to be drawn from this is that, in the baking of bread or biscuit, no serious diminution in vitamin B need be feared. In preserving and canning foodstuffs, however, the temperature employed is frequently much higher than 100° C., and tinned foods of all description are liable to contain very little or no vitamin B" (*Medical Research Council Report*).

McCarrison, as a result of an elaborate study on pigeons and monkeys, concludes that the symptoms occur in a definite order. The earlier manifestations are: (1) Distaste for food and loss of appetite; (2) Gastro-intestinal derangements, indigestion, colitis; (3) Loss of weight, and lack of vigour; (4) Headache, anaemia, and tendency to oedema; (5) Subnormal temperature, cardiovascular depression; (6) Finally, involvement of the central nervous system.

Findlay finds that complete absence of Nissl granules is the outstanding feature in the central nervous system. After treatment with yeast, the bird rapidly improves, and the granules reappear in the central nervous system. At the same time the lipoid content of the adrenal cortex, which is greatly increased in diseased birds, is considerably reduced as a result of the administration of the yeast. Findlay therefore considers that the deficiency specifically affects the nucleic-acid metabolism of the organism, and that vitamin B is an essential factor in the synthesis of animal nucleic acid. He brings evidence of a parallelism between the vitamin B content and the percentage of nucleic acid in the various organs of the ox.

The double rôle played by the vitamin B, antineuritic and growth-promoting, is very similar to that of the fat-soluble vitamin now differentiated into A and D. It is probable that these two effects may be due to the same vitamin. Salmon recently submitted evidence for the existence of two active fractions in the vitamin-B complex. He has shown that the comparative tests on seeds of the velvet bean and the soy bean, and on the leaves of the velvet bean and of the rape, have shown a higher antineuritic or beri-beri-preventing value for the seeds, and that the leaves are more potent than the seeds in their growth-promoting action. A fuller's-earth fraction which prevented experimental beri-beri of pigeons and rats, but which did not induce growth of rats, was prepared.

Vitamin C: the Water-soluble Antiscorbutic Vitamin.—It is agreed that scurvy results from lack of vitamin C. Holst and Frohlich found in 1912 that guinea-pigs rapidly develop the disease when confined to a diet of cereals or of bread. They observed also that, although the animals lost weight on a diet of carrots or turnips, scurvy did not develop. They also showed that the antiscorbutic substance is destroyed by cooking or drying. Much interest has been centred around the vitamin-C content of milk—natural, pasteurized, and dried. Dutcher, and also Hant, showed that the vitamin-C content of milk is dependent on the food of the cow, so that summer milk is much richer than winter milk. The vitamin is present in all fresh fruits and vegetables; tomatoes, oranges, lemons appear to be the richest in this respect, whilst apples are amongst the poorest. Cabbage, carrots, lettuce, and celery are all rich sources of this vitamin. It is the most unstable of all vitamins, but its resistance to heat is much greater in the absence of oxygen, which readily inactivates it. Bezssonov has prepared concentrated preparations of the vitamin, and

has obtained a substance free from fats and protein which is active in protecting guinea-pigs in daily doses of 0.1 grm.

It has been conclusively proved that man, monkey, and guinea-pig develop scurvy when deprived of vitamin C, but the rat, prairie-dog, and birds are apparently immune. Vitamin C has been found in the liver of rats which have been deprived since birth of any vitamin-C-containing substance, and these livers have been shown to be effective in the cure of acute scurvy in guinea-pigs.

Zilva showed that lemon-juice of pH 6.8 can be boiled in an atmosphere of CO₂ for two hours without loss of potency, while similar treatment for one hour in a current of air destroys more than 75 per cent. The loss in alkaline solution is much greater than in acid.

The storage capacity of the body for vitamin C is almost negligible. If given an abundance of lemon-juice before being placed on a scorbutic diet, the onset of scurvy is by no means delayed in guinea-pigs. In other words, the body requires a constant supply of vitamin C in the diet, a fact of importance in the diet of the infant. An infant fed solely on heated milk supplemented by foods without fresh fruit-juices is prone to develop scurvy within a few weeks, and, as McCollum remarks, when the child is ill, it is wiser and more profitable to scrutinize its diet than to await for spongy gums or swollen joints to show undoubted scurvy.

Vitamin D : the Antirachitic Vitamin.—Vitamin D is the term used to indicate the antirachitic vitamin present in cod-liver oil and in other animal fats. Vitamin D accompanies vitamin A, and is present with it in the unsaturated alcohols after vacuum distillation of the non-saponifiable residue of cod-liver oil. Until recently, few distinguishing features were known between the growth-promoting and the antirachitic properties of natural animal fats. Certain differences are now known, such as the increased resistance of vitamin D to oxidative destruction when heated in the presence of air. Cod-liver oil subjected to heat in a current of air for a certain period may still possess antirachitic power, whilst its growth-promoting property will have disappeared. Again, butter-fat has a much greater effect on xerophthalmia than cod-liver oil, whilst the antirachitic power of cod-liver oil is far superior to that of butter-fat. Also the antirachitic property of cow's milk can be materially increased by exposing the cow to sunlight, while the growth-promoting property is not materially affected. The arsenic chloride test for vitamin A again distinguishes it from D.

The relationship between calcium and phosphorus metabolism and the antirachitic vitamin is laid down in the report of the Medical Research Council : (1) An antirachitic vitamin in the diet corrects improper balance in the calcium and phosphorus intake, and the greater the disproportion or defect in these elements, the more important is the rôle of the vitamins in the prevention of rickets. (2) Even when the calcium and phosphorus balance is good, and the supply of each adequate, the absence of the antirachitic vitamin from the diet will result in the production of imperfectly calcified bone.

Hess, Unger, and Pappenheimer found that rats when subjected to a short period of sunlight each day did not develop rickets on a rachitic diet, whilst their companions that were kept in the dark showed positive signs of rickets. Ultra-violet radiations of a quartz mercury-vapour lamp were equally effective in antirachitic powers. Again, rats kept in complete darkness, if allowed an adequate diet, did not develop rickets. In other words, the antirachitic vitamin is essential in preventing rickets, while sunlight becomes an important factor in correcting lack of the dietetic portion necessary for normal ossification.

Recent work, especially by Steenbock and also by Drummond, has shown

that it is possible by ultra-violet radiation to induce substances that were previously inert to possess antirachitic properties. Cholesterol when exposed to the influence of ultra-violet radiation was found to be antirachitic; and this result was also obtained when it had been purified to a high degree. Recently, however, it has been shown that the purest cholesterol, when exposed to ultra-violet radiations, possesses no antirachitic properties.

Vitamin E.—It is noticed that when rats are fed on experimental food mixtures containing fat, carbohydrate, and protein in pure form, with enough salt and vitamin A and B, for a time they exhibit all the appearances of health. Sooner or later these animals exhibit complete sterility. The sterility induced is typical, and not seen in any other condition. Impregnation occurs, but after a period varying from twelve to twenty days the foetus becomes resorbed.

The vitamin E is present in most animal tissues, but not to any high degree. Cod-liver oil is lacking in E. It is abundant in lettuce, alfalfa, pea and tea leaves. Its content is high in oat and wheat embryo. It has been shown that vitamin E is transferred from mother to offspring during intra-uterine life, for the tissue of newborn rats cures female dietary sterility. It is fat-soluble and remarkably stable to heat, light, air, and many of the ordinary chemical agents. Evans, and Bishop, and later Sure, found that the sterility may be prevented or cured after its appearance by the addition of lettuce, meat, wheat-germs, or rolled oats. Wheat-germ oil is said to be especially effective even in very small doses.

Webster and Rosenheim have quite recently brought forth evidence to support this view that *ergosterol*, a highly unsaturated sterol, is the direct precursor of vitamin D, and that this substance is transformed into vitamin D when the skin is exposed to direct sunlight. Sunlight and cod-liver oil therefore cure rickets because sunlight produces in the skin the substance which cod-liver oil provides ready made.

Finally, it is worth quoting the concluding remarks of the Medical Research Council Report on Vitamins and Rickets: "It is now intelligible why rickets is a comparatively rare disease both in natives living under tropical conditions, and in the inhabitants of the Arctic zone. The extra sunshine experienced by the one set of people makes the smaller amount of calcifying vitamins in their diet do the work carried out by the larger intake of the Eskimo. People living in the temperate zone under modern industrial conditions of diet are often poorly supplied with both these therapeutic agents, and an intelligent application of the facts which have come to light may confidently be expected to result in the prevention of one of the most serious diseases to which urban populations are liable".

REFERENCES.—An excellent account of the subject is found in the following publications: *Medical Research Council Report*. "The Present State of Knowledge of Accessory Food Factors", second edition; Elmer V. McCollum, *Lectures on Nutrition, Our Present Knowledge of the Vitamins*; John Pryde, *Recent Advances in Biochemistry*.

VOMITING, PERNICIOUS, OF PREGNANCY. (See ANTE-NATAL CARE.)

WHOOPIING-COUGH.

J. D. Rolleston, M.D.

SYMPTOMS AND COMPLICATIONS.—A. G. Mitchell and L. S. Friedman¹ report a case of *extreme leucocytosis* in whooping-cough, of which some examples were given in the last MEDICAL ANNUAL (1927, p. 320). The patient was a male infant, age 4 months, in the third week of whooping-cough complicated by bronchopneumonia. The leucocytes numbered 233,600, of which 48 per cent were polymorphs, 45 per cent lymphocytes, 3 per cent large mononuclears.

2 per cent transitionals, and 2 per cent unclassified cells, a few of the last resembling myelocytes. The platelets seemed normal in number. There was no necropsy, so that leukaemia was not absolutely excluded; but the absence of splenic or marked lymphatic enlargement, the apparently normal number of platelets, the age of the patient, and the history did not suggest that disease.

K. Goldschmied,² who reports a personal case, states that only a few examples of *whooping-cough in pregnancy* have been recorded. According to Simpson, hæmorrhage and abortion are not frequent, even when whooping-cough occurs in the early stages of pregnancy. Schott has published a case of hydrorrhœa due to rupture of the membranes during violent attacks of coughing. In the puerperium pneumonia may arise as a complication. The newborn may contract the disease, as is shown by the examples recorded by Bouchut, Rilliet and Barthez, Cockayne and Phillips. Goldschmied's case was in a 2-para, age 38, who contracted whooping-cough in the last month of pregnancy, and gave birth to a healthy child one and a half weeks before the expected term. Delivery, which was accompanied by violent paroxysms of coughing, was somewhat precipitate. The child, who was kept away from the mother for five weeks, being fed with pumped-off breast-milk, did not contract the disease.

S. Cannata³ describes the following *urinary complications* observed among 600 cases of whooping-cough in the course of six years: (1) Slight and transient febrile albuminuria, which was frequent at the onset or decline of the disease. (2) Hæmaturia, which was rare and of short duration. Only six cases in which hæmaturia was preceded by subconjunctival hæmorrhages and bronchorrhagia were noted. (3) Hæmoglobinuria, which was also rare and transient; only four cases were seen at the onset. (4) Acute nephritis; 22 cases of glomerular nephritis and 5 of hæmorrhagic nephritis were observed. In some the attack was very severe and in four fatal. The hæmorrhagic nephritis was associated with subconjunctival hæmorrhages and repeated epistaxis. (5) Cystitis (47 cases) and pyelocystitis (8 cases) were fairly frequent.

E. Hässler⁴ gives the following statistics relating to *convulsions* in whooping-cough. Heubner observed them in 6 out of 187 cases (3·2 per cent), and Eckert in 25 out of 476 cases (5·2 per cent). During the last epidemic at Dresden severe generalized convulsions were observed in 14 out of 67 infants (20·8 per cent) and in 8 out of 53 (15·09 per cent) young children, which is an unusually high proportion. Of the 22 cases, 11 died, 10 of whom had pneumonia. G. H. Hogg⁵ records the case of a boy, age 16, who developed double *optic neuritis* in the earliest stage of the disease. There was no meningitis nor brain complication, nor were there any mechanical factors to explain it. The neuritis was apparently due to the toxins of whooping-cough. Complete recovery took place within three months. Hogg has found only six other cases of this complication on record. A. Fessler and F. Feyrter⁶ describe eight cases denominated *aphthoid* by Pospischill. It consists in a secondary infection of the skin and mucous membranes occurring in whooping-cough and measles patients, characterized by the presence of ulcers on the face and mucous membranes of the tongue, lips, cheeks, and larynx. Landsteiner, who inoculated the conjunctiva and buccal mucosa of rabbits with aphthoid material, noted a purulent conjunctivitis, but did not obtain any growth from the conjunctival exudate either in direct smears or in cultures. On the buccal mucosa, however, the typical gyrate lesions of aphthoid developed.

F. Moses⁷ has studied the *effect of whooping-cough on tuberculosis* in 33 children suffering from severe bone and joint tuberculosis who contracted pertussis. With the exception of two fatal cases in children who had had extensive pulmonary disease in addition to bone tuberculosis before their attack of pertussis, all recovered: 47 showed no obvious change in their condition, and

only 4 presented more or less aggravation of the local lesions. While not denying that whooping-cough often has an unfavourable effect on pulmonary tuberculosis, especially in infants and young children, Moses does not think it probable that immuno-biological processes are responsible for this result.

TREATMENT.—Hässler⁴ attributes his relatively favourable results in the treatment of convulsions in whooping-cough to the use of **Strontiuran**, a preparation consisting of strontium chloride and urea, which was given intramuscularly every two or three days in doses of $\frac{1}{2}$ to 1 c.c. A. Ströe and I. Angelescu⁵ report two cases in infants, age 4 weeks and 6 weeks respectively, in which the duration of the disease, and especially of the paroxysmal period, was considerably shortened by two injections of **Convalescent Serum**, the doses ranging from 5 to 10 c.c.

REFERENCES.—¹*Arch. of Pediatrics*, 1926, 617; ²*Wien. klin. Woch.* 1927, 186; ³*Pediatrics*, 1926, 662; ⁴*Jahrb. f. Kinderheilk.* 1926, cxiv, 376; ⁵*Med. Jour. of Australia*, 1927, i, 825; ⁶*Zeits. f. Kinderheilk.* 1926, xli, 489; ⁷*Ibid.* 1927, xliii, 395; ⁸*Compt. rend. Soc. de Biol.* 1927, xcvi, 1446.

X-RAY DIAGNOSIS.

C. Thurstan Holland, Ch.M.

At the meeting of the British Medical Association at Edinburgh in 1927, the Section of Radiography, which had been allowed to lapse, was revived. Two papers and two discussions filled in the one morning allowed. One of these, introduced by Stanley Melville,¹ was on X rays in the diagnosis of intrathoracic growths. Melville laid great stress upon the ease with which shadows of the various conditions found in the thorax due to growths, etc., could be shown by radiography, and the difficulties, and indeed the dangers, of attempting any differential diagnosis in the large majority of the cases from the X-ray examination alone. He had also seen no fewer than five cases of dermoid cysts of the thorax within twelve months (*Plates XLV, XLVI*). In the discussion it became evident that all the radiologists, in addition to several physicians who were present, were in agreement on the essential necessity of collaboration between clinician and radiologist in making a diagnosis and in interpreting the shadows revealed. The other paper, by N. S. Finzi, was upon the subject of X rays and radium in cancer of the breast (*see RADIOTHERAPY*, p. 375).

LUNGS.

Bronchiectasis in Childhood is the subject of a paper by L. Findlay and S. Graham² which is illustrated by many fine radiographs taken after the injection of lipiodol. The authors, after trying various techniques, found that in children it is necessary to give a general anæsthetic and enter the trachea through the cricothyroid membrane with a trochar with a diameter of 1.5 mm. and a curved end mounted with a flange like a tracheotomy tube, and provided with a stilette. After this 1 or 2 c.c. of a 4 per cent solution of novocain are injected, and then 15 to 30 c.c. of warmed lipiodol (*Plate XLVII*). Readers should refer to the paper for the full technique. The radiographs illustrate the value of this method of diagnosis very clearly, and it is obvious that more of the bronchial tree is shown by the one injection than is the case in adults. In a discussion on bronchiectasis, both authors³ give further information on this subject, with very full details as to methods.

Lipiodol.—E. Archibald and A. L. Brown¹ point out certain dangers in the introduction of iodized oil into the tracheobronchial system, whilst agreeing that in the vast majority of cases it is a safe procedure. Three cases are quoted. In one a man of 36 died from acute pneumonia after the administration of lipiodol; a woman of 27 had an immediate severe reaction with rise of temperature; in a woman of 28 with quiescent pulmonary tubercle a severe

febrile reaction with accompanying symptoms was brought about. Conditions in which lipiodol should certainly not be injected include pulmonary tubercle with hæmorrhage or pyrexia, suppurative bronchorrhea with fever, and pulmonary gangrene.

F. G. Chandler and J. M. Young⁵ publish a comprehensive paper on the same subject, describe the methods of injection which they use, and illustrate with a few striking radiographs. A few cases are used to show both the positive findings and the limitations of usefulness. They consider that the method is simple and harmless. It is valuable in the demonstration and localization of bronchiectasis, in which, indeed, in many cases it is the only method of proving the diagnosis; and it is also of service in distinguishing bronchiectasis from lung abscess, from empyema with a bronchopleural fistula, and from tuberculosis.

THORAX.

X-ray Findings in the Healthy Chest.—A valuable report⁶ on the clinical and X-ray findings in the healthy adult chest, conducted by three groups, each consisting of a radiologist and a clinician, and working independently, is worthy of note. The cases examined were divided into two groups: (1) from the ages of 20 to 30 years, (2) from 45 years onwards. The report is a combined one, and is well illustrated. It is comprehensive, and deserving of study by all radiologists, especially those who specialize in chest work.

The Hilum Shadow.—F. Baum⁷ considers that one of the most difficult problems for the radiologist is to distinguish between the normal and pathological hilum shadow. In a well-illustrated paper he attempts to show that there is a characteristic translucent interspace between the lower part of the hilum shadow and the adjacent edge of the heart in cases in which a normal hilum is present. It is most marked on the right side. In pathological conditions of the hilum this interspace is changed or obliterated.

Annular Shadows.—S. Arnell⁸ describes and illustrates a case of *asthma* in which the patient died fourteen days after radiographic examination. The skiagrams showed large numbers of annular shadows in both lungs which were reported as being probably caused by cavities. The post-mortem showed a great number of subpleural emphysema blebs in size from that of a pea to that of a hen's egg in the lungs. It thus seems to be proved that annular shadows shown in lung radiographs may sometimes be caused by these emphysema blebs.

Fibrocystic Disease.—A rare and interesting case of this disease is reported by P. Kerley,⁹ with radiographs and microphotographs. The diagnosis from the X-ray point of view appeared to lie between bronchiolectasis and lymphangitis carcinomatosa, tubercle being ruled out. The patient died, and post-mortem the lung was found to be generally riddled with cysts varying in size from a pin-head to one $1\frac{1}{2} \times 1\frac{1}{2}$ in. Complete histological findings are given. The author suggests that the condition was congenital in origin, analogous to the case of congenital cystic kidney; another opinion was that it was an inflammatory trouble and analogous to cystic disease of the breast following chronic mastitis.

Chalcosis.—F. Möller's¹⁰ paper on porcelain worker's lung is illustrated by a large number of very fine radiographs, which are arranged in order to show the points in differential diagnosis of this condition from other lung conditions such as tubercle, carcinomatosis, and syphilis. It is considered that having reached a certain stage of development the changes shown are diagnostic on a flawless radiograph, but that it is all-important to consider the history, physical signs, and so on, and fit them in with the X-ray findings.

Pleural Effusions.—A paper by L. R. Sante¹¹ on the X-ray diagnosis of pleural effusions, either general or local, is well written, and the illustrations are very convincing as regards various points of diagnosis which arise in these cases. The most important part of this communication is that emphasizing the value of the lateral-position radiograph, not necessarily in the complete lateral, but in any semi-lateral position which is found on the screen to be the best for showing the lesion. This lateral radiograph, so seldom used, is often of value in clearing up many otherwise doubtful diagnoses. In discussing the question of there being any difference in the shadow cast by free fluid in the upright and lying-down position, the author states that he has not found any material change in the level of the fluid. [This is a very interesting point, but whether the actual upper level of fluid alters or not, I am absolutely certain that in most cases the appearances are so changed by the alteration in position of the fluid that an accurate diagnosis can at once be made. I use this as a routine in all cases, and always compare the pictures in the standing-up and lying-down position.—C. T. H.]

The Heart.—In a valuable paper on the results arrived at from a radiological examination of thirty-four cases of *aortic regurgitation* of doubtful etiology, G. W. Holmes¹² states that this method of examination is of distinct value, though not infallible, in the differentiation of the aortic regurgitation of syphilitic, rheumatic, arteriosclerotic, and hypertensive origins. He describes in detail the points which are of importance and have to be looked for in X-ray examination, and gives diagrams and a series of radiographs.

H. Wallace Jones and R. E. Roberts¹³ report a case in which the radiograph during life showed a fine opaque line outlining almost the whole of the lower (ventricular) part of the flask-shaped heart shadow. Practically no pulsation was visible on screen examination on that part of the heart shadow encircled. The diagnosis made was *calcification of the pericardium*. The radiograph is reproduced and the scanty literature referred to.

Foreign Bodies in Œsophagus and Bronchi.—An important paper on experiences in bronchoscopy and œsophagoscopy, by Herbert Tilley,¹⁴ has many points of interest for the radiologist as well as the general practitioner. The remarks made by the author on radiography are terse, very much to the point, and very true. He emphasizes that every case of known or suspected foreign-body inhalation or swallowing should be examined by an 'expert' radiologist, and that a second examination immediately before the operation for removal must be made if any definite interval has elapsed since the first examination. He refers to a case where an inefficient X-ray examination did not show a foreign body; twenty-one months later a paper-fastener was shown in a bronchus and was removed.

[I am entirely in agreement with the author. Two striking cases at least have come under my observation. A diagnosis of an open safety-pin in the stomach was made, and acting on this a surgeon opened the stomach—to find no pin. I saw the plate on which the diagnosis had been made: it was entirely useless, and a smudge on the film had been taken for the shadow of the pin. The safety-pin, open, with the business end pointing upwards, was found by radiography in the œsophagus behind the upper end of the sternum. The child lost its life. In the second case a doctor had some teeth extracted under an anæsthetic, immediately after which he developed a cough with bad attacks of breathlessness. This went on for a day or two, and after two radiographic examinations he was assured that no tooth had been inhaled. Not satisfied with his symptoms he came to me, and on the screen, and on plates, a large piece of a molar tooth was easily demonstrated in the right descending bronchus. It was immediately removed. The only

inference possible in this case is that a negative diagnosis was made on plates of such a quality that the radiologist should have known they were unreliable.—C. T. H.]

STOMACH AND INTESTINES.

Thoracic Stomach.—Only three cases have been recorded of this condition, according to R. E. Roberts,¹⁵ in adding a fourth to the literature. This, a female child, age $3\frac{1}{2}$ years, he illustrates with three radiographs. These show that the whole stomach is in the thoracic cavity above the diaphragm, somewhat bilocular in shape after the test food, with the pylorus opening through the right side of the diaphragm (*Plate XLVIII*). The bibliography is fully reported.

Gastro-intestinal Perforation.—M. H. Todd¹⁶ suggests that this condition can be diagnosed by an X-ray examination with certainty and in a very simple manner. In the upright position, if a perforation has taken place there will be a bubble of gas above the liver. In the sitting position, with the breath held, a rapid exposure is made to show the upper abdomen and the diaphragm. In a suspected case, if a gas bubble is shown above the liver the certain diagnosis is at once made possible, and it is to be noted that this sign is a very early one. Details of ten cases are given.

Cure of Gastric Ulcer.—An illustrated paper by F. G. Nicholas and A. Moncrieff¹⁷ discusses the results of medical treatment of gastric ulcers, the presence of which has been demonstrated by radiographs. It contains a note on the technique of X-ray examination, and tables the after-results of treatment. The paper is based upon the observation for a period of two years of seventeen cases of gastric ulcer shown by a crater on the lesser curvature, and the illustrations go to prove that in some cases the characteristic 'niche' entirely disappeared: it is also observed that accompanying this disappearance the clinical signs and symptoms subsided.

Duodenum.—A comprehensive paper by E. L. Kellogg and W. A. Kellogg¹⁸ on *chronic duodenal stasis* is of interest radiologically. This paper discusses, with illustrations, the various conditions which may cause such a stasis, and also deals with the characteristic physical signs and symptoms. In discussing the X-ray findings, which usually make the diagnosis clear, the authors consider four types: (1) The asthenic duodenum in which the X-ray examination may show delay or puddling in the duodenum, with sluggish peristalsis; (2) Duodenal obstruction with incompetent pylorus, in which the examination is negative or shows reverse peristalsis; (3) Obstruction, with hypertrophy, in which the 'writhing' duodenum is seen on the screen; (4) Dilated duodenum, which is readily demonstrated.

A Danger of the usual Barium Meal.—J. F. Montague,¹⁹ in suggesting a modification in the technique of X-ray examinations of the gastro-intestinal tract, states that in a series of 106 cases of anal fissure it was observed that 47 had a barium meal examination prior to the occurrence of the fissure, and that the cause of the fissure was directly due to the passage of hardened lumps of barium or bismuth. He therefore suggests, in order to avoid this happening, that the meal should be made up of one part petrolagar, two parts water, and two parts barium sulphate. This mixture he reports as being safe and more palatable than the majority of such mixtures, the chalky taste of the barium being almost entirely concealed. [This observation is interesting, but with a large experience of bismuth and barium meal work, both in hospitals and in private, I have never heard of a single case in which fistula in ano occurred.—C. T. H.]

GALL-BLADDER.

Cholecystography.—Those interested in the general question of the radiology of the gall-bladder will find a paper by J. F. Brailsford²⁰ very useful. He begins with an historical review of the literature from 1899, when C. Beck claimed to have shown gall-stones, up to the classical work of Gråham and Cole. The paper covers the whole ground of technique and the various radiological methods, and summarizes the author's own experience of 92 cases of intravenous injection, and his reasons for using this method in preference to the oral. A very complete bibliography is added, and the many beautiful illustrations add considerably to the value of an interesting review.

Francis Davies²¹ has investigated the *normal gall-bladder* as to its size, shape, and position, in 100 students, after the oral administration of sodium tetraiodophenolphthalein. The method and technique are fully described. Amongst other findings two or three stand out as of importance. It was found that both the position of the gall-bladder and its rate of emptying varied with the type of bodily habitus, and that a correlation can be established between bodily habitus, gastric motility, and the rate of emptying of the gall-bladder. An extremely important finding, as bearing on the reliability of the negative evidence, was that in a certain number of the cases—i.e., normal individuals—the gall-bladder failed to fill and so was not shown at a first examination, but when re-examined exactly in the same manner a few weeks later it filled and emptied quite normally.

Many articles are still being published on this subject, and it does not appear to be settled yet as to whether the best routine is to give the drug intravenously or by the mouth. The paper by J. H. Mather and W. R. Williams²² is important, inasmuch as it appears to emphasize the oral method, and to prove that, if this is carried out with all the infinitesimal care of detail which is required, it is quite as accurate in its findings as the venous method, and it has an enormous advantage over the latter from the points of view of facility and risk. The paper is based upon 125 consecutive cases in which surgical findings confirmed the radiographic findings in 94·3 per cent. Readers should refer to the paper for details of technique. It is insisted upon that the success of the oral method depends on (a) obtaining a reliable salt, (b) the care used in the preparation of the capsules and their coating, (c) intelligent co-operation on the part of the patient; and in hospital work it is very necessary that the sisters and nurses should thoroughly understand the importance of the procedure. [We may say that with further experience of the oral method both in private and in hospital work, we are convinced as regards its reliability if only an exact technique is followed; but it is very necessary that care should be taken to impress upon patients the necessity of following instructions to the letter, and they should be supplied with printed instructions which should be explained to them.—C. T. H.]

With this paper should be read one on the same subject by D. P. D. Wilkie and C. F. W. Illingworth,²³ based on a series of 158 cases where the intravenous method was used, and in 132 of these cases operation followed. Their results do not materially differ from those of Mather and Williams; but the authors admit that in 50 operations when the gall-bladder shadow was normal they had 8 cases in which there was, as a fact, gall-bladder pathology present; and that in 50 cases where no shadow of the gall-bladder was shown they had 6 in which a normal gall-bladder was found at operation.

W. H. Stewart and E. J. Ryan²⁴ consider, as a result of 500 examinations, that the oral method is by far the best and is quite as reliable as the intravenous. Their paper is illustrated by many fine radiographs showing various

PLATE XLV

DERMOID CYST OF THE THORAX

(DR. STANLEY MELVILLE)



Anterior view of thorax. (Diagnosis proved at post-mortem.)

PLATE XLVI

DERMOID CYST OF THE THORAX—*continued*

(DR STANLEY MELVILLE)

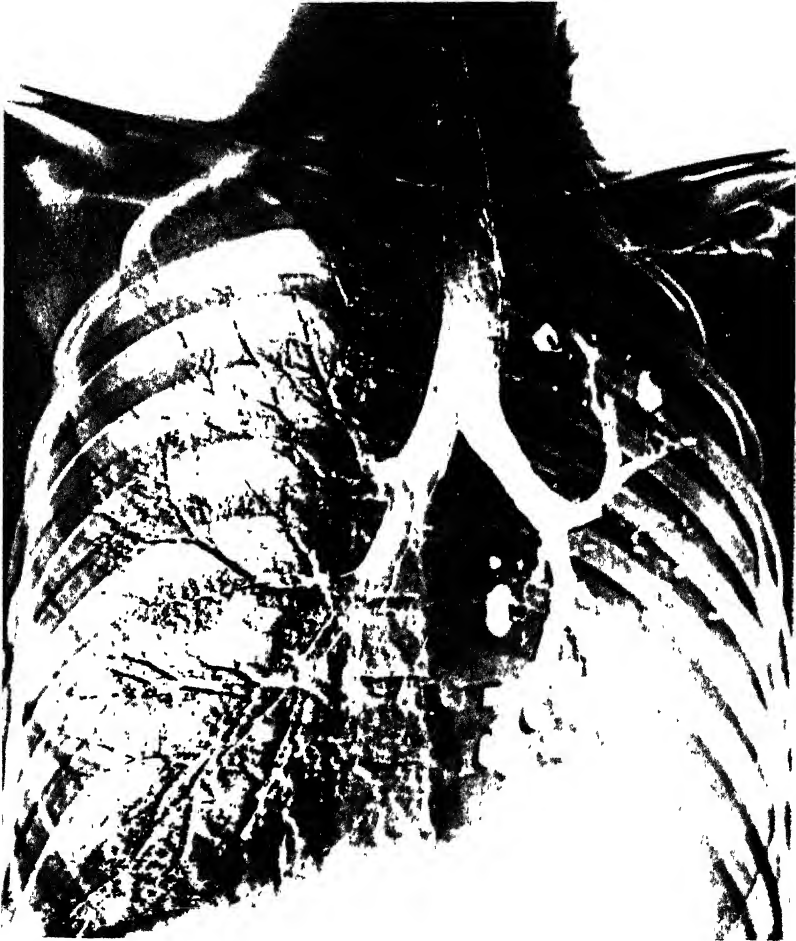


Lateral view of thorax.

PLATE XLVII

BRONCHIECTASIS IN CHILDHOOD

(PROFESSOR FINDLAY AND DR. D. CAMPBELL SUTTIE)



Iodine shown in the trachea and bronchi. Bronchiectasis on left side; heart and trachea displaced to left.

PLATE XLVIII

THORACIC STOMACH

(DR. R. L. ROBERTS)

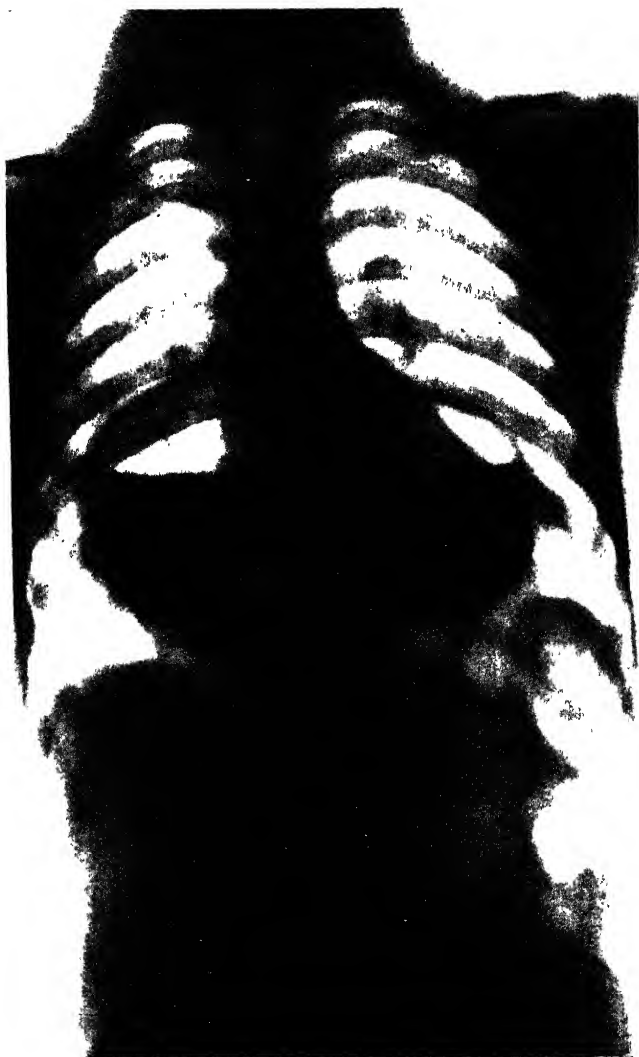


PLATE XLIX

LIPIODOL INJECTION OF FALLOPIAN TUBES

(DR. R. E. ROBERTS)



Showing both tubes tortuous and occluded.

PLATE L

LIPIODOL INJECTION OF FALLOPIAN TUBES—*continued*

(DR. R. E. ROBERTS)



The left tube is seen to be occluded. A small amount passing through right tube.
A case of sterility.

PLATE LI

'MARBLE BONES'

(SUROPSHIRE ORTHOPEDIC HOSPITAL)



Lateral view of chest in a case of 'marble bones'. (Note density of sternum.)

PLATE LII

'MARBLE BONES'—*continued*

(SHROPSHIRE ORTHOPÆDIC HOSPITAL)



Pelvis in a case of 'marble bones'.

PLATE LIII

EROSION OF VERTEBRÆ BY AN ABDOMINAL ANEURYSM

(DR. J. F. BRAILSFORD)



conditions. These authors also lay great stress on the very expert nature of this work, and the necessity of both skill and care. Technique is of paramount importance, attention to detail both on the part of the patient and the radiologist is imperative. In cases in which no gall-bladder is shown, they advise a re-examination, again by the oral method, and are against the practice of checking the oral by the intravenous.

J. S. Sproull²⁵ describes a method of administering sodium tetraiodophenolphthalein by the mouth *without* the use of capsules or pills, and claims that the results are equally as good as when the drug is administered in capsules designed to pass out of the stomach intact and to dissolve in the small bowel. He gives the following directions: "Take no medicine to act on the bowels. Eat the evening meal as usual if desired. At 8 p.m. add all the medicine in the capsules (it is dispensed in plain gelatin capsules, each containing 0.5 grm. of the dye, total dosage 2 to 3 grm.) to 4 or 6 tablespoonfuls of cooked cream of wheat (cold). Mix thoroughly and add syrup to flavour. Eat the whole at 8 p.m. Drink water freely until midnight, but do not eat anything more. After midnight do not eat or drink." The first examination is made at 8 a.m.; then nothing to eat or drink till 1.30 p.m., when the second examination is made. Then a meal rich in fats, and a third examination two hours later. Radiographs illustrating this method are reproduced, and appear to be satisfactory.

J. D. Lawson,²⁶ basing his observations upon 500 consecutive gastro-intestinal cases, in which a diagnosis of cholecystic disease was made in 196, and 100 consecutive cases in which the examination was made by the intravenous injection of sodium tetraiodophenolphthalein, has formed the opinion that the former method of X-ray examination is of greater reliability than the latter. [This is a statement entirely at variance with the generally accepted experience of most clinicians and radiologists, and as his technique for the Graham method is his own, and does not conform to that usually followed, it is open to criticism in drawing any conclusions as to the relative value of the two methods.—C. T. H.] (*See also* CHOLECYSTOGRAPHY, p. 84.)

SPLEEN.

P. Trillat²⁷ makes a point of the enlarged spleen in the newborn infant as a *sign of congenital syphilis*. This spleen can be demonstrated by X rays. He considers this sign as important in the diagnosis of congenital syphilis as a positive Wassermann reaction or an epiphysial osteochondritis. The hypertrophied spleen is not always present, but it is frequently found, and may be three times as large as it should be. It is best shown by turning the child slightly over on to its left side.

GYNECOLOGY AND OBSTETRICS.

Iodipin Injections.—The simple technique used for the injection of iodipin for the purpose of diagnosis in uterine cases is described by Q. U. Newell²⁸ in a paper which is illustrated by many fine radiographs. These latter demonstrate in no uncertain manner the possibilities of this method. No unfavourable reaction was observed in any of the 38 cases examined (*Plates XLIX, L*). The author concludes with a short summary of the conditions in which the method is indicated and likely to be of use. Seven c.c. are injected slowly and gently, and the X-ray examination is made immediately afterwards. The author has found this procedure valuable in many conditions, such as showing the size and shape of the uterine cavity and any encroachment on it, as from growth; in cases of suspected foreign body; to distinguish the uterus from other palpable masses; to determine tubal obstruction and to localize it.

Fœtal Injury by X rays.—P. Werner²⁹ makes a report on the children of 45 pregnancies in 22 women who had their ovaries previously irradiated by X rays. Several of the children, approximating to 20 per cent, died in early infancy. Of those living, 4 had congenital malformation of the heart and trachea, 5 had other minor abnormalities, and several others were not normally healthy. In 3 cases X-rayed during pregnancy, 1 child was an idiot. Zappert has reported a series of 22 similarly treated cases in which only 10 of the children showed no physical anomaly, whilst 6 of them were classified as microcephalic idiots, or mongols.

On the other hand, W. Flaskamp³⁰ defines two grades of X-ray treatment of the ovaries: (1) To produce a temporary amenorrhœa and sterility, i.e., a strong dose; and (2) A dosage not large enough to produce amenorrhœa. In the latter case ovarian function is not arrested but ripe ova may be severely damaged, and as conception is possible there is risk of damage to the offspring. However, amongst the 200 pregnancies observed after the production of a temporary amenorrhœa—the first class of cases—no children were damaged and all were healthy. This is considered to be evidence to show that the ovary completely regains its function. The author advises that conception should be avoided in the period between treatment and the onset of amenorrhœa, and that any pregnancy occurring during this period should be terminated.

Pelvimetry.—An account, illustrated by radiographs and diagrams, is given of a very simple method devised by R. E. Roberts³¹ for the accurate measurement of the pelvic brim. This method has been made possible by the Potter-Bucky diaphragm and double-coated, double-screened film. The principles involved are: (1) The brim of the pelvis is placed parallel to the X-ray film; (2) The central ray is made to pass vertically to the plane of the brim and through its centre. The result is a symmetrical enlargement of the shadow of the brim, and a simple sum in proportion—the distance from the anticathode to the film being known—gives at once the true size of the opening in all its diameters. The technique and mathematics are described.

KIDNEYS.

Papillomata and Renal Stone.—M. M. Melicow³² draws attention to the danger of confounding the shadow made on the film by a papilloma of the skin with renal stone. He illustrates two cases in which, in the renal area, and distinctly simulating stone, he found shadows caused (*a*) by a papilloma of the skin in which there was a trace of calcium, phosphorus, and magnesium, and (*b*) by a fibroma of the skin without any trace of these chemicals. [The significance of this is that the skin of the back should always be examined in making examinations for possible kidney or ureteral stone.—C. T. H.]

BONES AND JOINTS.

Secondary Carcinoma.—A. J. Bendick³³ calls attention to the fact that, whilst in all cases it is recognized that an X-ray examination of the thorax and its contents should precede any operation for cancer of the breast, this alone is not enough. If unnecessary mastectomies are to be avoided, an X-ray examination of the whole pelvis on a film large enough to show the upper part of each femur together with the lower lumbar vertebræ should also be taken. It is pointed out that bone metastases, as a rule, show very well in the above areas, may be present without any lung involvement, are not at all uncommon, and occur not only in cases of advanced disease of the breast but also where at the time no palpable lump exists in a breast. The writer considers the pelvic plate more important than the lung examination.

Sarcoma.—A most important paper by A. Kolodny³⁴ on bone sarcoma, the primary malignant tumours of bone, and the giant-cell tumour, though not strictly radiological, should be read by every radiologist. The paper, which is the outcome of the experience of the registry of bone sarcoma undertaken by the American College of Surgeons, is full of illustrations, radiographs, and microphotographs, and is based upon the personal study of the 700 cases registered and an extensive review of the literature. It entirely undermines the sanctity and invulnerability of the pathological diagnosis, and has resulted in a new classification of bone tumours, whilst the benignity of the giant-cell tumour has been established.

Brittle Bones.—J. A. Key³⁵ describes a case of brittle bones with blue sclera, with radiographs before and after operation, where the exact pathology is described for the first time. The X rays showed a general decrease in the size of the bones, with a concentric atrophy, some cortical striation of compact bone, and coarseness of the structure of the spongy bone. This paper is of interest inasmuch as it helps in the diagnosis and classification of certain cases of brittle bones which from the X-ray point of view offer many difficulties. The author considers the form he describes as hereditary, and differing in this respect from osteogenesis imperfecta, osteopsathyrosis with white sclera, and marble bones (*Plates LI, LII*).

Vertebral Column.—It is known that in children, if lateral-view radiographs of the vertebræ are taken, in the middle of the shadow of the bodies there may be shown a cleft extending backwards in a greater or less degree through the body. (*See Plate LI*). These clefts are developmental, associated with a vein or veins, and as a rule are not seen radiographically in adult life. A. O. Freedman,³⁶ however, relates a case in which the radiograph of the spine of a man of 25 years showed faint horizontal fissures running through the bodies of the 10th, 11th, and 12th dorsal vertebræ. The man died and the spine was excised, and further radiographs showed that these fissures were present in the bodies from the 9th dorsal to the 5th lumbar vertebra inclusive, and were due to the persistence of a large vein. The importance of this observation is the possibility of such an X-ray appearance being mistaken for fracture or other pathological condition.

The Mastoid Region.—A. Granger³⁷ publishes an excellent article on the X-ray technique for the examination of the mastoid region and the petrous bone. He describes his own method for obtaining satisfactory results in using the positions advocated by Law and Arcelin, and the localizer which he invented for these purposes. A series of radiographs illustrate the various points. The paper concludes with a description of a new position devised by himself. This paper from the technical point of view should be very useful.

Loose Bodies in Joints.—Harry Platt,³⁸ in a paper on this subject in which the knee-joint is especially discussed, stresses the value of the radiographic examination, and the direction in which it can furnish valuable diagnostic and pre-operative information. This article is of importance to radiologists, apart from its surgical interest, inasmuch as the author points out that it is not only the showing of these loose bodies which is necessary, but that the actual site must be demonstrated. As he remarks, when the symptoms of internal derangement of the knee suggest the presence of a loose body, a systematic X-ray examination is essential. This should be directed to the discovery of a possible area of osteochondritis dissecans, loose bodies in process of detachment, and loose bodies free in the joint cavity.

Derangements of the Knee-joint.—M. A. Burnstein and R. A. Arens³⁹ claim that the inflation of the knee-joint with CO₂ is a valuable aid in the differential diagnosis of derangements of the knee-joint presenting symptoms of pain,

swelling or effusion, and lameness. Radiographs should be taken before and after inflation. It is claimed that the operation, except for slight and evanescent pain, is harmless and simple. The appearances seen in the normal and abnormal joints are described. [Some twenty years ago cases were reported in which oxygen had been used for similar purposes, and it was claimed that displaced cartilages could be demonstrated, but the method appears to have quickly passed into desuetude.—C. T. H.]

MISCELLANEOUS.

The Brain.—S. C. Davidson⁴⁰ reports, with radiographic illustrations, two cases of traumatic pneumoventricle of the cerebrum, both associated with fracture of the skull. The author suggests that the presence of a discharge of cerebrospinal fluid through the ears or nose should make one suspect the presence of this condition, and that the absolute diagnosis can be made by X-ray examination.

Erosion of Vertebrae Due to Aneurysm.—In a paper on the X-ray examination of the spine, J. F. Brailsford,⁴¹ amongst other conditions, describes a case of erosion of lower dorsal and lumbar vertebrae caused by an abdominal aneurysm (*Plate LIII*). The interesting point is the demonstration that it is sometimes possible from the X-ray findings alone to arrive at the correct diagnosis, this case having been referred with a provisional diagnosis of carcinoma of the splenic flexure. The beautiful X-ray appearances seen in the lateral views of the spine are discussed by the author, and a correct diagnosis was made from them. Death and a post-mortem examination confirmed the X-ray diagnosis.

Compensation Cases and X Rays.—A medical defence society has recently seen fit to warn its subscribers that, in the treatment of *all* cases of fracture or suspected fracture, it has become necessary that the medical attendant should invariably ask for and advise an X-ray examination, and, in the case of its being for any reason refused, should obtain written evidence to that effect. The reason of this action is that it has become almost impossible to defend an action with any chance of winning if this precaution has not been taken. Apropos of this subject, A. E. Barclay⁴² discusses many interesting points bearing upon the value of the radiological evidence in compensation cases. Much of what he says concerning the importance or otherwise of the X-rays in the assessment of damages is very true; but when he states that thousands of cases of suspected bone injury are radiographed not to make a diagnosis but simply to protect the doctor, we are not at all in agreement with him. The mere question of diagnosis—Is there or is there not a fracture?—is only part of the X-ray finding, and with a very large experience of fracture work it is obvious that, altogether apart from diagnosis, the importance of a radiographic examination is that the information it gives is material to the proper treatment of a fracture, and that with few exceptions it is not safe to assume that a radiograph is merely to safeguard the doctor. With regard to what he says generally as to the bias which radiographs may give in compensation cases, most county court judges are well able to assess the value of the X-ray findings, more especially if they have the assistance of a skilled and expert radiologist and have not to rely upon the ordinary medical witnesses.

X-ray Lies.—Under this title an illustrative and amusing paper by F. E. Diemer⁴³ points out in a series of short notes how X-ray mistakes are made. He includes in his list cases in which radiographs did not show lesions which should have been shown—the reason being bad technique. He also quotes a prominent surgeon as having an ideal classification for lies. He says there are

three kinds of lies—plain lies, dam lies, and X-ray pictures. The final case he alludes to was that of a young lady referred to a radiologist for X-ray treatment of a uterine fibroid. She had repeated doses of X rays, the tumour increased in size, and in due course a baby was born. There is much to be learnt in this short paper by those who wish to learn.

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X-RAY THERAPY. (See RADIOTHERAPY.)

YAWS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

DISTRIBUTION.—The areas of Burma affected by yaws have been investigated by G. G. Jolly,¹ who found the disease highly prevalent on the Lower Chindwin and nearly all the districts around Upper Burma, to the west of the Irrawaddy River, extending through the hills to near the Assam border. G. C. Ramsay² discusses the origin of yaws in Assam, and concludes that it spread from Burma.

IMMUNITY.—A valuable series of papers on yaws have appeared in the *Philippine Journal of Science*, including an investigation of immunity in yaws by G. R. Lacy and A. W. Sellards³ by means of inoculating patients who had been treated with apparent success by neosalvarsan. In four patients inoculated after an interval of six months, one developed characteristic granulomata and the rest showed atypical results; renewed treatment cleared up two, and the others resolved spontaneously. After another two years a fresh reinoculation produced the disease only in the patient who had responded on the previous occasion, his first attack having been a short one, and the other three showed well-marked resistance to yaws; the authors therefore consider that active immunity to yaws develops during the second stage. Further work on superinfection in yaws has been carried out by A. W. Sellards, G. R. Lacy, and O. Schobl,⁴ with the result of showing that superinfection by means of inoculation can be produced even after the primary granuloma has developed, and they are doubtful whether resistance to reinfection later is due to the development of some active immunity, or to the persistence of a low-grade infection. Five of six volunteers developed typical granulomata on inoculation, and all of them on reinoculation showed treponemata-containing granulomata. The same authors⁵ describe and illustrate some of the skin lesions of yaws, and emphasize the affection of the palms of the hands. L. Lopez-Rizal and A. W. Sellards⁶ describe and picture the clinical modifications of yaws seen in mountainous districts of Luzon, the striking feature of which is that in about 90 per cent the lesions are limited to the mucocutaneous junctures of the mouth, nose, anus, and genitalia. O. Schobl and J. Ramirez⁷ discuss the

globulin-precipitation test in yaws, and conclude that it is much simpler than the Wassermann test, so that it is useful in early diagnosis and in estimating when cure has taken place.

TREATMENT.—L. Lopez-Rizal, P. Gutierrez, and L. Fernandez⁸ report a field control test of yaws in the Pamamaque district of the Philippines, during which 1151 cases were treated among a population of 11,466, *Neosalvarsan* being given in doses of approximately 0.01 grm. per kilo. body weight. One or two injections had a great effect in clearing up the cases, but did not completely cure. Out of 319 cases followed up, 301 were found to be cured, and 18 had only improved or had relapsed, including 6 tertiary cases, which required repeated injections. After six months, 34 new cases had developed, indicating the necessity for providing continuous medical attendance, as intermittent operations are unsatisfactory; but the people have learnt the value of the treatment, and yaws could be eradicated by intensive treatment and persistent vigilance. R. J. Navarro⁹ has used the Wassermann reaction to estimate the efficiency of neosalvarsan treatment in a field dispensary, 100 cases being tested from three months to three years after treatment, with the result that 82 per cent gave negative reactions, 51 per cent of whom had only had one injection. Of the 18 positive cases, 7 showed yaws lesions clinically. W. L. Moss¹⁰ reports the results of treatment five years before by full doses of neosalvarsan in 1046 cases in the Dominican Republic, in 570 of which the results were noted one to six weeks later, when 19.8 per cent receiving one injection, and 51.5 per cent with two injections, were found to be cured or practically cured. Five years later 419 were examined again: 195, or 46.5 per cent, remained uncured, and 224, or 53.5 per cent, had been free from symptoms for approximately five years. The Wassermann reaction was positive in 85.7 per cent at the first examination, and in only 29 five years later. *Stovarsol* in yaws is discussed by P. S. Selwyn-Clarke¹¹ in Ashanti, and the great advantages of an oral over an injection treatment in that area is pointed out. Four-grain tablets were used, and two given the first day, three on the second and third days, and four on the fourth day, and after one day's omission two were given on each of the sixth and seventh days, with a total of 64 gr. in adults, children receiving smaller doses. Striking effects were obtained. Most of the patients crippled with *clavus* were able to walk well in five to twenty days and ulcerations had healed, granulomatous lesions began to dry up in three days and disappeared in nine days, and no relapses had been noticed up to the date of reporting. The only disadvantage was some abdominal discomfort and looseness of the bowels, which he thinks may be overcome by distributing the total amount of the drug over a longer period.

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YELLOW FEVER.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

ETIOLOGY.—During the past year some important work has been published on the Pfeiffer reaction with the leptospira associated with Weil's disease and yellow fever. Thus M. Theiler and A. W. Sellards¹ record work that throws some doubt on the etiological relationship of *L. icteroides* of Noguchi to yellow fever, in support of which Noguchi largely relied on the Pfeiffer phenomenon for their differentiation. The present writers have repeated these experiments with *L. icterohaemorrhagiae* of Weil's disease, or epidemic jaundice, obtained from rats, and with *L. icteroides* supplied by Noguchi: they have failed to confirm the observations of the last-named worker, but they found that

guinea-pigs protected against *L. icterohæmorrhagiæ* were also immunized against *L. icteroides*, and vice versa, indicating the serological identity of the two organisms, contrary to Noguchi's findings. In a further paper, A. W. Sellards² reports examinations of the sera of patients who had recovered from yellow fever only about three and a half months previously, and gave negative Pfeiffer reactions to both *L. icterohæmorrhagiæ* and to *L. icteroides*, contrary to the statements of Noguchi, but the serum of two guinea-pigs immune to the first-named organism gave positive Pfeiffer reactions against both organisms, thus furnishing additional evidence of their identity; the failure of the sera of these eleven yellow-fever cases to show this phenomenon is greatly against the *L. icteroides* being the true cause of yellow fever. As it is known that Weil's disease occurs in tropical America, and the disease is exceedingly difficult to differentiate from yellow fever clinically, these observations raise the question whether Noguchi really obtained his *L. icteroides* from cases of Weil's disease, which were mistaken for yellow fever. It is also pointed out that if *L. icteroides* is the cause of yellow fever, rodents form an almost unlimited reservoir of infection, and also that the occurrence of negative Pfeiffer reactions in typical cases of yellow fever facilitates the problem of determining the nature of the disease described as yellow fever in Africa.

D. W. Schuffner and G. Sieburgh³ deal with a method of the early microscopical recognition of the leptospiræ of Weil's disease and of yellow fever, which they consider superior to Blanchard and Lefrou's triple centrifuge method.

Yellow Fever in West Africa.—W. H. Hoffmann⁴ regards most of the coast of West Africa from Senegal to the Congo as an endemic centre of yellow fever and as a danger to the world, and he advocates the usual anti-mosquito measures in all large ports with non-immune European populations for its control, as well as the destruction of all mosquitoes found in yellow-fever houses and the protection of contacts by Vaccines of killed cultures of *L. icteroides*. A. B. Aitkin and E. C. Smith⁵ record an analysis of the clinical symptoms in eight cases of yellow fever at Lagos. Anti-icteroides serum was used in four cases without producing any unfavourable reaction. The early stages present no absolutely distinctive feature, and they present many resemblances to malaria; but by the third day the diagnosis is usually obvious in most cases from the presence of stasis, with general prostration, and congestion of the face and conjunctiva. They regard the presence of an occasional malarial ring or crescent in the blood as inconclusive of the fever being due to malaria. The most diagnostic point is the rapid increase of albumin in the urine in yellow fever within one or two days to Esbach I, which they have not seen in malaria; and slow pulse and steady persistence of nausea and vomiting are suggestive of yellow fever, for in malaria gastric disturbance tends to be remittent rather than constant. Clinical notes of the cases and the microscopical lesions found in fatal cases are also recorded in detail.

REFERENCES.—¹*Amer. Jour. Trop. Med.* 1926, Nov., 383; ²*Ibid.* 1927, March, 71; ³*Jour. Trop. Med. and Hyg.* 1927, Feb. 15, 48; ⁴*Ibid.* 1926, Oct. 15, 349; ⁵*Trans. Roy. Soc. Trop. Med. and Hyg.* 1927, April, 530.

Miscellaneous.

THE EDITOR'S TABLE.

Samples (not returnable) and particulars for this section should be sent to The Editors, 'Medical Annual' Offices, Stonebridge, Bristol, not later than NOVEMBER 1.

We are anxious to express no opinion except as a result of practical knowledge, and it is owing to this fact that a notice in the MEDICAL ANNUAL has come to be valued.

NEW PHARMACEUTICAL PRODUCTS AND DIETETIC ARTICLES.

We are always ready, when a sufficient quantity is sent to us EARLY IN THE YEAR, to arrange for these to be tested in hospital practice and reported upon; under other circumstances our knowledge is necessarily more limited; but frequently the simple information as to where a particular preparation can be obtained is all the practitioner requires.

NEW MEDICAL AND SURGICAL INSTRUMENTS AND APPLIANCES.

We give Inventors and Manufacturers the opportunity of bringing their work before our readers free of cost to themselves, subject to the following conditions:—

1. *Every article sent for examination should be accompanied by an undertaking from the maker that he is the original manufacturer; or, in the case of articles of foreign manufacture, the country of origin and the date of its earliest production should be stated.*

2. *Each article must have the novelty or improvement claimed for it clearly stated upon a SEPARATE sheet or sheets of paper. This should have attached to it any illustration (WHICH MUST BE SMALL) for which insertion is desired, and also bear the maker's name.*

The Editors cannot accept reference to circulars or catalogues as a compliance with these conditions.

PROGRESS OF PHARMACY, DIETETICS, Etc.

Agar-Crisp.—A palatable and appetizing form of prepared agar that can be taken with milk or cream in a similar manner to the usual prepared breakfast foods. It overcomes the objections to the insipid taste and flabby, gelatinous consistency of plain agar. It is supplied in sealed tins containing 4 oz. by Parke, Davis & Co., London.

Alepol.—This is a selected fraction of the sodium salts of the total fatty acids of *hydnocarpus* oil.

In 1916 Sir L. Rogers recorded the use of the sodium salts of the lower melting-point fatty acids of *chaulmoogra* oil intravenously in leprosy, with the production of general and local reactions, accompanied by destruction of the lepra bacilli in the tissues. This method had the drawback of irritating the veins at the seat of injection, leading to their obliteration, making it very difficult to apply in some men and in most women and children; this caused it to be displaced very largely by the intramuscular injection of the ethyl esters after Dean and Hollmann had shown their value in many cases in Honolulu about 1918, although some authorities still consider the original intravenous injection to be a more active method of treatment.

Rogers also found that the higher melting-point *chaulmoogric* acid had little action in leprosy, and its sodium salts were less soluble and more irritant than the lower melting-point ones. Recently he has become more convinced than ever that his first method is more effective than the ethyl esters, and has endeavoured to get over the vein trouble by the use of sodium, potassium, and ammonium salts of the lower melting-point fatty acids, after removal of most of the *chaulmoogric* acids.

After experiment he found that a 1 per cent solution was best, and that this could be given subcutaneously and intramuscularly painlessly, as well as by the intravenous method. This preparation was made for him by Burroughs Wellcome & Co., and is stocked by them. As severe reaction occurs in some cases it is advisable to begin with small doses twice a week and gradually increase them. When any well-marked reaction occurs, the remedy should be omitted for ten days at least.

Anti-Gas-Gangrene Serum.—During the War, as the result of special researches, most of which were carried out at the Wellcome Physiological Research Laboratories, a series of anti-gas-gangrene sera for prophylactic use and for treatment was produced, and these products were used on the various fronts with promising results.

In view of the importance attaching to the presence of the causative organism of gas gangrene in some cases of peritonitis and acute intestinal obstruction, a standard *B. welchii* toxin of uniform and stable constitution has been prepared. Clinical trials appear to indicate that a serum made against this toxin may be of great value to the surgeon in dealing with complications due to the presence of *B. welchii*.

'Wellcome' Anti-Gas-Gangrene Serum (W) (*B. welchii*) is the outcome of the production of a standard toxin from which it is possible to produce a reliable antitoxin.

In addition to its use in cases of paralytic ileus it is anticipated that it may find a field of utility in wounds caused by accidents in streets or fields where infection by anaerobic organisms may occur. In cases of peritonitis suspected of anaerobic toxæmia it has been suggested that administration of serum should begin at the earliest possible moment—before operation if practicable—the initial dose being 80 c.c. intramuscularly and in extreme cases an additional 40 c.c. intravenously. After the initial dose, 40 c.c. to 80 c.c. should be given every day until the bowels are moving spontaneously and regularly, and distention has almost or completely gone, and absorption of toxin consequently been brought to an end. In cases of acute intestinal obstruction the indications for the use of this antitoxin are, broadly speaking, the same as those above. Cases, however, are often deceptive and unexpectedly develop profound toxicæmic symptoms after successful operation. Therefore it was suggested by the same writer that a prophylactic dose of 40 c.c. of antitoxin intravenously and 40 c.c. intramuscularly should be given. Afterwards, as in cases of peritonitis, the administration of serum should be continued until normal evacuation of the bowel is re-established.

Anti-Gas-Gangrene Serum (W) (*B. welchii*) is issued by Burroughs Wellcome & Co. in 10-c.c. hermetically sealed phials, and, as with all their sera and vaccines, is made in England.

Antigen (Kahn Standard).—An antigen prepared from cholesterinized extract of beef heart muscle, used in the laboratory diagnosis of syphilis. The Kahn test is a simple and reliable precipitation test requiring only the antigen and saline solution in addition to the patient's blood serum. The reaction takes place a few minutes after the reagents are mixed, and a complete test can be made within an hour after obtaining the blood sample. The antigen is supplied in phials containing 10 c.c. by Parke, Davis & Co., London, W.1.

Anti-Pneumococcus Serum, Type 1.—Serum protecting against infection with pneumococcus, Type 1, in laboratory tests is now widely used in the treatment of pneumonia. Such a serum is prepared at the 'Wellcome' Physiological Research Laboratories. Anti-pneumococcus serum is tested against cultures of pneumococci of such virulence that 0·000001 c.c. of an 18-hour culture will kill a mouse. A dose of 0·2 c.c. will protect a mouse against 0·1 c.c. of the culture, i.e., one hundred thousand fatal doses. It is thus reasonable to expect favourable clinical results. Anti-pneumococcus serum, Type 1, is supplied in phials containing 25 c.c. by Burroughs Wellcome & Co.

Anti-Pyorrhœa Mouth-wash.—An alcoholic ammoniacal preparation, pleasantly flavoured and sweetened with saccharin. It neutralizes the acid decomposition products and thus prevents caries of the teeth, while its stimulating action promotes a healthy condition of the gums. A teaspoonful in half a tumbler of warm water should be used night and morning as a mouth-wash. Its regular use is strongly recommended. The price is 5s. 6d. per lb. from R. Sumner & Co. Ltd., Liverpool.

Calmitol.—A dermal lotion for the treatment of all skin diseases with which there is intense itching. It is non-toxic and penetrates the skin readily. Its value is well recognized. (H. R. Napp Ltd., 3-4, Clements Inn, W.C.2.)

Cataplasma Magnesium Sulph.—This is a paste containing 70 per cent of dried magnesium sulphate in glycerin, to which 3 per cent of carbolic acid has been added. It has been used with great benefit in the treatment of boils, whitlow, etc. Its effect is especially marked in obstinate cases of carbuncle, as it rapidly reduces inflammation and draws the pus to the surface. The beneficial use of the cataplasma is chiefly due to its powerful osmotic action. The tin should be allowed to stand in a bowl of hot water until the cataplasma is warmed through; then it should be spread on plain lint and applied to the affected part, the dressings being frequently changed. It is issued in air-tight tins containing 1 lb., price 2s. per tin, by R. Sumner & Co. Ltd., Liverpool.

Collosol Cod-liver (Oil with Yeast).—In our last issue we mentioned favourably the 50 per cent emulsion of cod-liver oil produced by the Crook's Laboratories, 22, Chemies Street, W.C.1. They have now added to it yeast extract. This counteracts any tendency to liver trouble when large doses of cod-liver oil are taken, and also supplies vitamin B in its most efficient form. There are many cases where this preparation will meet the difficulty of administering cod-liver oil, and it will be acceptable in all.

Compral.—This is an equimolecular compound of tri-chlor-ethyl-urethane, a mild, well-tolerated and harmless sedative, and dimethyl-aminophenazone ('pyramidon'), the well-known antipyretic and analgesic. In this chemical combination the hypnotic property of the one drug is counterbalanced by the stimulant action of the other, while by synergic action an increased analgesic effect is obtained. Compral is indicated in pain of whatever origin, and has proved particularly successful in the treatment of dysmenorrhœa, in doses of $5\frac{1}{2}$ to 15 gr. It has the advantages of being rapid in action and free from secondary effects such as drowsiness or vertigo; it has no cumulative action and is not habit-forming. (Bayer Products Ltd., 19, St. Dunstan's Hill, E.C.3.)

Cremor Kaolini.—A suspension of colloidal kaolin in water, with cardamoms, caraway, and cinnamon added as carminatives. This is an effective agent for the treatment of diarrhœa and other intestinal complaints. Kaolin, which is aluminum silicate, can exist in two forms—crystalline and colloidal; the latter, which is prepared by an electro-osmotic process, has been found superior to the ordinary levigated preparations of crystalline kaolin, as the colloidal form adsorbs to a marked degree the toxins in the alimentary canal and so renders them harmless.

Cremor kaolini does not interfere with the functions of digestion and is free from constipating effects, which is not so in the case of bismuth carbonate, commonly used for the treatment of intestinal troubles. Dose for adults: half to one tablespoonful three times a day, half an hour before food. For children: half to one teaspoonful according to age.

Kaolin being less expensive than bismuth, cremor kaolini is an economical preparation. The price is 2s. per lb. from R. Sumner & Co. Ltd., Liverpool.

Digitalis in 'Cat Unit' doses.—Upsher Smith 'Cat Unit' Digitalis is digitalis standardized by the Hatcher cat method as modified by Magnus. The physiological potency of the drug is definitely determined, so that this digitalis may be administered by the method of Cary Eggleston, in massive doses, to produce in emergencies complete digitalization in as short a time as twenty-four hours. It is also suitable for administration in the usual dosage for digitalis.

A cat unit of digitalis is the amount of digitalis required to kill 1 kilo. of cat when an extract of it is injected intravenously at constant rate. The massive dosage recommended by Cary Eggleston is one cat unit for every ten pounds of patient's body weight: to this amount must be added about two cat units a day to replace elimination, and the total amount is administered in one, two, or three days.

It is supplied in tablets of digitalis folia approximately 1 gr., and also in the form of tinctures, with a special pipette for measuring a 'cat unit', and is prepared by Matthews Laboratories Ltd., Clifton, Bristol.

Diphtheria Antitoxin, 2000 Units in 1 c.c.—The chief obstacle in the way of administering large doses of antitoxic sera lies in the difficulties and inconvenience attending subcutaneous injection of such a comparatively large volume of fluid as that in which the required dose of antitoxin is contained. During recent years, however, methods have been devised and developed which make it possible to separate the antitoxin-bearing fraction of the serum from those proteins which, while adding to the bulk of the preparation, are devoid of antitoxic value. The fraction of the serum removed in the process of concentration is probably at least equally responsible with the antitoxin-bearing proteins for those incidental toxic symptoms which sera may produce in susceptible patients. With concentrated diphtheria antitoxin it is found in practice that rashes and other undesirable symptoms occur very much less frequently than with untreated serum, and that when such effects do occur they are of a milder type.

For many years Burroughs Wellcome & Co. have produced diphtheria antitoxin of a concentration of 1000 units in 1 c.c. or less. They are now preparing concentrated diphtheria antitoxin containing 2000 units in 1 c.c. in phials containing 5 c.c.

Ephedrine.—This is an alkaloid from the Chinese drug Ma Huang. The reputation of Ma Huang amongst the Chinese as an antipyretic, diaphoretic and bronchodilator appears to rest upon a sound basis, and it is satisfactory to learn that it provides the

source of the alkaloid ephedrine, which can be standardized chemically so as to ensure uniformity of therapeutic effect.

Pure ephedrine and its salts have been found to resemble adrenalin in character and action, but to possess the advantage of more persistent effect, which may be secured equally by oral or hypodermic administration. The clinical trials so far conducted show that even when administered by the mouth it causes a rise in blood-pressure commencing in twenty to thirty minutes and persisting for two hours. This indicates its value in shock following surgical operation. In adrenal insufficiency (Addison's disease) a case is reported in which complete relief from the symptoms was obtained by persistent administration of ephedrine. It produces mydriasis less rapidly but more powerfully than cocaine, and has been employed in its place (*China Medical Journal*, Vol. xxxix, No. 11, Nov., 1925).

The early anticipation that ephedrine might find a wide field of utility in the treatment of hay fever and asthma has received confirmation in the striking results reported of its use in these conditions. Not the least of its advantages in these conditions is its efficiency when given by the mouth and its suitability for administration to patients of all ages from six to seventy years.

Burroughs Wellcome & Co. supply the following preparations: 'Tabloid' ephedrine hydrochloride, gr. $\frac{1}{2}$ in bottles of 25 and 100, and 'Hypoloid' ephedrine hydrochloride 0.03 grm. (gr. $\frac{1}{2}$ approx.) for hypodermic injection, in boxes of ten 1 c.c. phials.

Ephedrine Sulphate.—This can now be obtained in tablets containing $\frac{1}{2}$ gr., suitable for either oral or hypodermic use. It is supplied in tubes containing 10 tablets by Parke, Davis & Co., London, W.1.

Ephetonin.—This is synthetic ephedrine, and is a compound with adrenalin effect. It provides oral administration, instead of adrenalin injections, in bronchial asthma, hypotonia, etc., and in hay fever. It is also supplied in ampoules for subcutaneous injection by H. R. Napp Ltd., 3 and 4, Clements Inn, W.C.2.

Ergotoxine Ethanesulphonate.—Discussion and research have recently centred round ergot and its preparations and have resulted in a stabilization of knowledge regarding the pharmacology of the several active principles found in ergot. The investigations indicate that the alkaloid ergotoxine is chiefly responsible for the characteristic action of ergot on the uterus. Originally introduced by Burroughs Wellcome & Co. many years ago, ergotoxine has been available as 'Tabloid' hypodermic ergotoxine and ergotoxine phosphate. A further development of the work on ergot has resulted in the production of ergotoxine ethanesulphonate. This new salt is white, crystalline, stable, and more soluble than the phosphate, and it presents ergotoxine in a state of exceptional purity. The ethanesulphonate salt therefore represents an advance in ergot medication. It is issued in tubes containing 0.1 grm. The new salt should also prove of interest to pharmacologists who require a standard preparation for test purposes.

Hæmoplastin (Oral).—Recent experimental work has demonstrated that this valuable physiological blood coagulant is active when administered orally. For this purpose it is issued in rubber-stoppered phials of 5 c.c., constituting one dose, by Parke, Davis & Co., London, W.1.

Iodaseptine (Cortial).—Iodaseptine (iodo-benzo-methyl-mono-formine) is a powerful bactericide and, combining as it does iodine with formaldehyde and the phenyl radicle from benzo-methyl ether, is the antiseptic 'par excellence' for chronic infectious conditions. It is non-toxic, well tolerated, produces neither local nor general reactions, and has the advantage of allowing really intensive iodine treatment, by intravenous or intramuscular injection, without fear of iodism. Iodaseptine has been extensively used for a considerable time in all the Paris hospitals, while frequent recommendation and reference has been made to the product in the French medical journals, in the treatment of chronic rheumatism, pulmonary tuberculosis, bacillosis, sclerosis, tropical diseases, etc. The ampoules are issued in two strengths, 'A' and 'B,' containing 20 and 50 cgrm. of iodaseptine respectively. Tablets of the same strengths are also available for oral administration. (The Anglo-French Drug Co. Ltd., 238a, Gray's Inn Road, W.C.1.)

Krysolgan.—Krysolgan is the sodium salt of amino-auro mercaptol benzol-carbonic acid, with the formula $C_6H_5NH_2SAu.COONa$, and it has lately come into prominence in the treatment of lupus erythematosus. Reference may be made to the papers read

by Dr. Semon before the Royal Society of Medicine, Section of Dermatology (*Proc. Roy. Soc. Med.* July, 1927.), and before the Dermatology Section of the British Medical Association, July, 1927. (Schering Ltd., 3, Lloyd's Avenue, E.C.3.)

Kurchi Bark.—Recent medical researches seem to favour the belief that, in the successful treatment of amoebic dysentery (one of the chief problems in tropical medicine) kurchi bark will prove to be of considerable value. In the *Annual Report of the Calcutta School of Tropical Medicine*, 1925, it is stated that "kurchi is extremely well tolerated in very large doses, and often appears to eradicate an amoebic infection." Tabloid extract kurchi corticis (B. W. & Co.) was employed. Reference is also made to the fact that kurchi is available when there are objections to stovarsol and yatren on the score of uncertainty, ocular complications, and high prices. As a result of these investigations, Burroughs Wellcome & Co. are issuing 'Tabloid' kurchi bark extract, gr. 5, for more extended clinical trial in the treatment of amoebic dysentery.

Lobulina tablets are a compound of fresh extracts of pancreas gland with a yeast of considerable glycolytic power, convenient for oral administration in the treatment of diabetes mellitus. (H. R. Napp Ltd., 3 and 4, Clements Inn, W.C.2.)

Magnesium-Perhydrol contains a constant percentage (25 per cent) of chemically pure magnesium peroxide. It is used where increased oxidation is desired, and is given in many gastro-intestinal disturbances, such as weak digestion, gastric hyperacidity, etc. It is now available in tablets or in powder form. Its value in cases of flatulence and pyrosis is well recognized. (H. R. Napp Ltd., 3 and 4, Clements Inn, W.C.2.)

Medinal.—Medinal has recently come into prominence as a result of the attention which the insoluble barbiturates have received in the medical press. For some reason medinal has been classed with the insoluble cumulative barbiturates, whereas it is clear from its composition that it is freely water soluble. Hence it is readily absorbed and eliminated and free from the dangers undoubtedly associated with the insoluble salts. For the benefit of those practitioners who wish to ensure that the medicament be taken only under their observation, the makers have prepared cachets each containing 5 or 10 gr. These are ordered as "Schering's cachets M5" or "M10" corresponding to the imprint on each cachet. Thus the patient is not aware of the drug which is being prescribed. (Schering Ltd., 3, Lloyd's Avenue, E.C.3.)

Mirion.—This is a new organic compound of hexamethylenetetramine with iodine, giving none of the usual reactions of iodine—proving that there is complete chemical combination between the components. It is indicated in syphilis, gonorrhoeal complications, and—perhaps of the greatest importance—in arthritis deformans. It is prepared in series of ampoules for intramuscular injection, commencing generally with 2 per cent mirion. Some interest has been aroused in this country over this product, as a result of the favourable reports which have been published on the Continent. (Schering Ltd., 3, Lloyd's Avenue, E.C.3.)

Myosalvarsan.—This brand of sulpharsenobenzene is intended for the painless intramuscular and subcutaneous administration of salvarsan therapy. Given in the appropriate dosage its action equals that of neosalvarsan, while its method of administration circumvents the difficulties of intravenous technique. It is indicated in all forms and stages of syphilis, especially in congenital syphilis. Myosalvarsan may be given to infants and children, to aged and feeble persons, and to patients in whom the ordinary salvarsan injections tend to produce nitritoid crises. Injection is best made into the fatty tissue overlying the gluteus medius muscle in the upper and outer quadrant of the buttock. (Bayer Products Ltd., 19, St. Dunstan's Hill, London, E.C.3.)

Neutralon.—A new synthetic aluminium silicate, this is free from the drawbacks associated with the alkaline treatment of hyperacidity, hypersecretion, etc. No increased stimulation follows its action, which is marked also by the absence of eructation, purgation, or constipation. Many clinical reports refer to the excellent results obtained in the above-named conditions as well as in gastric and duodenal ulcers.

Belladonna-Neutralon contains neutralon with 0.6 per cent extract of belladonna. This is indicated particularly where the condition is accompanied by an increased vagus irritability. (Schering Ltd., 3, Lloyd's Avenue, E.C.3.)

Orargol.—This is a complex gold-silver colloid, electrically prepared and stabilized, which exceeds all other anti-infectious colloids in its efficacy. It is indicated in all infections and in pre- and post-operative treatment. Injected in time and in suitable

dosage it is capable of cutting short serious cases of influenza, pneumonia, etc., and being non-toxic may be used without hesitation in all febrile conditions. Orargol injections have been successfully employed in influenza, pneumonia, infective endocarditis, acute articular rheumatism, epidemic encephalitis, and puerperal infections.

Given orally, orargol is absorbed by the digestive tract and acts as an indirect antithermic in all pyretogenous forms of infections. As a non-toxic intestinal antiseptic it is very effective, especially in chronic diarrhoeas, intestinal toxæmias, and their sequelæ. Being non-irritating, it can be applied, without fear of complications, to the most delicate mucous membranes, and marked success has attended its use in ophthalmic and rhinolaryngeal affections. It is available in 5 c.c. and 10 c.c. ampoules, solution, and in O.R.L. outfits. (The Anglo-French Drug Co. Ltd., 238a, Gray's Inn Road, W.C.1.)

Pancreatins Tablets (Sansum).—Enteric-coated tablets containing 5 gr. of triple strength pancreatin, equivalent to 15 gr. of pancreatin U.S.P. Originally devised as an auxiliary to insulin treatment to enable patients to assimilate an adequate diet, they have proved of considerable value in other nutritional diseases where the digestive system is unable to cope with a diet sufficient for the needs of the body. The coating is unaffected by the gastric juices, but dissolves in the duodenum. They are supplied in bottles containing 100, by Parke, Davis & Co., London, W.1.

Plasmoquine and Plasmoquine Compound.—This drug represents the latest advance in the therapy and prophylaxis of malaria. Plasmoquine, an alkyl-ammo-6-methoxy-quinoline salt, is an entirely new synthetic derivative of the quinoline ring, and its action on the plasmodium of malaria is approximately sixty times greater than that of quinine, while it has a specific effect in destroying the gametocytes of the parasite. Plasmoquine compound represents plasmoquine combined with quinine in the proportion of 0.005 gm. plasmoquine and 0.0625 gm. quinine in each tablet. This addition of quinine is definitely indicated in subtertian malaria, where quinine has a greater effect than plasmoquine on the schizonts. The compound is to be used further in prophylaxis, in mixed types of malarial infection, or where no differential diagnosis as to type has been made. In blackwater fever and malarial splenomegaly the compound should also be used. The addition of quinine to plasmoquine has the further advantage in all types of malaria of obviating the possibility of methemoglobinæmia occurring, a secondary effect which has been noted in some cases where plasmoquine alone was exhibited. The drug is well tolerated by children. (Bayer Products Ltd., 19, St. Dunstan's Hill, London, E.C.3.)

Prokliman.—This is an ovarian hormone compound tablet supplied by The Clayton Aniline Co. Ltd., London. As its name indicates, prokliman is designed to combat disorders associated with the climacteric. In combination with the liposoluble ovarian hormone (sistomensin) it contains nitroglycerin, amidopyrin, caffeine sodium salicylate, and peristaltin. According to numerous reports which have been published, the compound would appear to be of service in alleviating hot flushes, irregular hæmorrhages, sweating, cardiac distress, headache, pain in the adnexa, and constipation associated with the 'change of life.' An appropriate dose appears to be two tablets two or three times a day, and, after treatment for a short time, the distressing symptoms are reported to be rapidly alleviated. In some cases, however, it is necessary for over a hundred tablets to be taken before the patients are entirely free of symptoms.

Quinine and Urethane Solution.—This is now prepared in ampoules containing 2 c.c. of sterile solution for the obliteration of varicose veins by injection. This solution is similar to the one recommended by Douthwaite in his recent book on this subject. It is supplied in boxes containing half a dozen 'Claseptic' ampoules, by Parke, Davis & Co., London, W.1.

Schultz-Charlton Test Solution.—The serum of a patient taken about ten days after defervescence from scarlet fever will, in virtue of its antitoxic content, when injected intradermally into the rash of other scarlet fever patients, produce a characteristic blanching of the rash at the site of injection. This Schultz-Charlton reaction is a valuable aid in the diagnosis of 'doubtful scarlet fever.' It is usually carried out with scarlet fever antitoxin made in the horse. Such antitoxin is available in the Schultz-Charlton test solution. Ordinarily 0.2 c.c. of a 1 in 10 or 1 in 4 dilution with normal saline solution is injected intradermally into the skin of the chest, abdomen, or forearm, where a uniform scarlet fever rash not more than seventy hours old is available. A blanching from 10 to 40 mm. in diameter makes its appearance in from 4 to 10 hours and persists from 12 to 72 hours. A positive blanching result, so far as is known, justifies a definite diagnosis of scarlet fever. Schultz-Charlton test solution is issued by Burroughs Wellcome & Co. in phials containing 1 c.c. and 5 c.c.

Septicemine (Cortial).—Septicemine (iodo-benzo-methyl-di-formine) is a combination of iodine and formaldehyde similar to iodaseptine (q.v.), from which it differs in containing a smaller percentage of iodine and a larger proportion of formaldehyde. Its intensity of antimicrobial action, its total absence of general reaction, its absolute innocuity to the patient, and its rapid defervescent action make it especially valuable in the treatment of all acute infections and septicemic conditions.

Its administration by intravenous injection is applicable in serious infections of the nervous centres (acute meningitis, myelitis, etc.), intestinal infections (peritonitis, appendicitis), infections of the respiratory tract (acute bronchitis, congestion, etc.), surgical infections (pre- or post-operative), and in septicemias, influenza, puerperal fever, infective anginas, etc. Septicemine is available in boxes containing 8 ampoules of 4 c.c. (The Anglo-French Drug Co. Ltd., 238a, Gray's Inn Road, W.C.1)

Synthalin.—This is the first synthetic product having an insulin-like action for oral administration. It is a guanidin derivative of somewhat involved chemical structure, and has been the subject of a very large number of reports from Continental clinics. Most of these are favourable, and as they were published well before the treatment was available in England, too high hopes were held here as to its possible value. The reports of the investigators appointed by the Medical Research Council (*Lancet*, Sept. 3, 1927) were on the whole disappointing. Although the general conclusion drawn from the too few cases on which experiments were made was that this was not an ideal insulin substitute, yet, 'synthalin may be regarded as a partial success, giving at least a hope for further progress in the same direction.' Subsequent to this report, Dr. Calvert, in the *Lancet*, Sept. 24, 1927, arrived at a rather more favourable conclusion, but it is clear that synthalin can only be regarded as a beginning.

The gastric symptoms, which many observers have found so troublesome in some cases, may be obviated by taking with each dose of synthalin a small dose of elixir camphor monobromide made with glycerin instead of sugar. A résumé of practically all the reports which have so far appeared is available from the makers' agents in this country, Schering Ltd., 3, Lloyd's Avenue, E.C.3.

'Tabloid' Thyroxine.—Thyroxine, the active principle of the thyroid gland, is now issued by Burroughs Wellcome & Co., as 'Tabloid' thyroxine in bottles of 100. Two strengths are available, 0.0001 grm. and 0.001 grm. The dose for adults is from 0.0002 grm. to 0.002 grm. orally. Minimum doses should always be given at first, and the optimum amount for each case should be determined by trial.

Trophil is an organic lime and arsenic compound which is of considerable value in cases where treatment with arsenic is indicated. It has been proved to be very easily tolerated and seldom gives rise to gastro-intestinal disturbances or other symptoms subsequent to the ordinary arsenic cures, and, in particular, there is no offensive smell from the breath. (H. R. Napp Ltd., 3 and 4, Clements Inn, W.C.2.)

Vaccineurin neurotropic injection consists of *Staphylococcus pyogenes* and *Bacillus prodigiosus*. It is indicated in all diseases of the nerve substance, particularly neuritis, sciatica, neuralgia, and rheumatism; it has also been used with good results in bronchial asthma. (H. R. Napp Ltd., 3 and 4, Clements Inn, W.C.2.)

Valisan.—This is a compound of organic bromine with the borneol ester of isovalerianic acid. While indicated in the first place as a mild sedative, the value of the organic bromine constituent has latterly assumed importance on the assumption that, in its organic form, bromine exercises a more lasting effect on account of its gradual slow absorption, longer circulation, and slower excretion; hence bromism may be avoided and the bromide effect intensified. Valisan has lately come into prominence as a routine mild soporific, and the fact that it is free from any sort of 'poison' restriction may be considered a point in its favour. Valisan is practically odourless, easily taken in the form of perles, and causes no eructation or nausea. (Schering Ltd., 3, Lloyd's Avenue, E.C.3.)

Veramon.—Veramon first came into prominence as a safe routine analgesic. Although diethylbarbituric acid enters into its composition, yet by the process of manufacture it is completely detoxicated, and it is a point of interest that the administration of veramon produces no hypnotic effect, although where pain has been the cause of the insomnia the analgesic effect of the veramon permits natural sleep to supervene. Further, of outstanding interest are the reports which have appeared of late dealing with the significance of veramon in the relief of dysmenorrhœa. (Schering Ltd., 3, Lloyd's Avenue, E.C.3.)

MEDICAL AND SURGICAL APPLIANCES.

Aiming Device in Cisterna Puncture.—It is usual to aim the point of the needle at the root of the nose, taking the ear-hole as a guide, but there are obvious difficulties to this method to the inexperienced, because the root of the nose is out of sight and the ear-hole is in the wrong plane. The theca may also be missed by lateral deviation. The device illustrated (*Fig. 87*) is adjusted on the patient to the nose bridge and to the

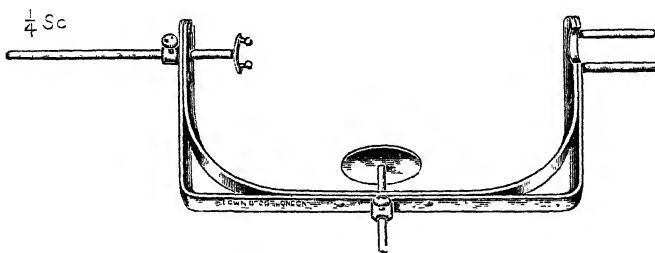


Fig. 87.

ear laterally. The puncture needle is entered between the two guides, which are fixed to point permanently at the nose bridge. When the direction of the needle is thus correctly fixed by its penetration into the neck the guide is removed. Designed by Dr. F. C. Eve, of Hull, this is made by Down Bros. Ltd., 21 & 23, St. Thomas's Street, S.E.1.

Bracket, The 'Davon'.—This represents a successful attempt to produce a well-made and serviceable electric bracket (*Fig. 88*), at a moderate cost. Cheapness is not sacrificed to efficiency and solidity of construction. The wall arm is of steel and rotates in very strong bearings in a horizontal radius of 90 degrees. The forearm is

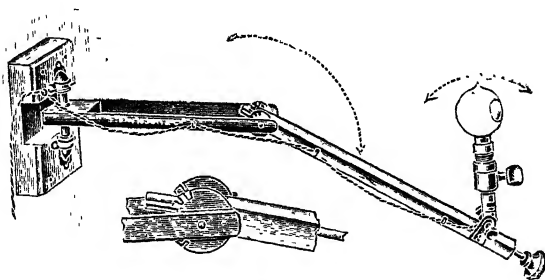


Fig. 88.

of nickelled brass, and can be adjusted in a vertical direction above or below the centre. It is self-locking in the position the lamp is desired to assume. One hand only is necessary to adjust it, and when not in use the lamp will fold flat to the wall. The price with bulb is £2 5s. 6d. from F. Davidson & Co., 143-149 Great Portland Street, W 1., who are the makers.

Brain Trocar.—This trocar (*Fig. 89*) is made blunt-pointed with an opening at the side and is used for ventricular puncture. The figures on the side serve to show the depth to which the trocar has been inserted. Rubber tubing may be attached to the bulbous end, and the trocar is fitted with a smoothly working stilette. Designed by Mr. Norman M. Dott, F.R.C.S.Ed., it is made by J. Gardner & Son, Edinburgh.

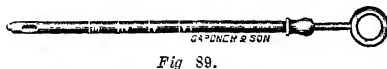


Fig. 89.

Cautery (Electric).—The Post electric cautery is a valuable addition to our surgical

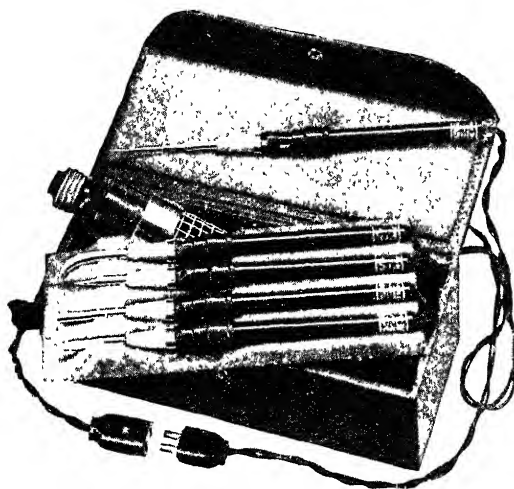


Fig. 90.

appliances, and is constructed on scientific principles under the guidance of prominent surgeons. It works from any electrical current (alternating or direct), and is supplied with resistances for various voltages. There is a variety of cautery points suitable for all purposes. The instrument is distinctly portable, light, handy, and safe. The knives are solid silver and therefore do not oxidize. They do not become cold when applied to tissue, and ensure uniform correct temperature with little or no bleeding. The complete outfit (Fig. 90) with four points in a leatherette case weighs about 2 pounds, and is obtainable from Chas. F. Thackray, Park Street, Leeds, and 119 High Holborn, W.C.1.

Forceps.—

Forceps for Applying

Cushing's Suture Clips.—These forceps (Fig. 91) are used in conjunction with Mr. Norman M. Dott's automatic machine for making Cushing's suture clips. The clips are mounted automatically into the jaws of the forceps, and are then ready for insertion without any trouble or difficulty. The forceps are made both straight and angled by J. Gardner & Son, Edinburgh.

Forceps for Threading Needles of the Reverdin Type.—The illustration (Fig. 92) shows a 'U'-shaped forceps designed by Mr. Selvadurai, house surgeon, General Hospital, Colombo, and used and recommended by Mr. R. L. Spittel, M.R.C.S.

The thread is held taut between the jaws of the forceps, which will be found of assistance in the correct placing of the ligature without touching the same with the gloved fingers. The makers are Down Bros. Ltd., London, S.E.

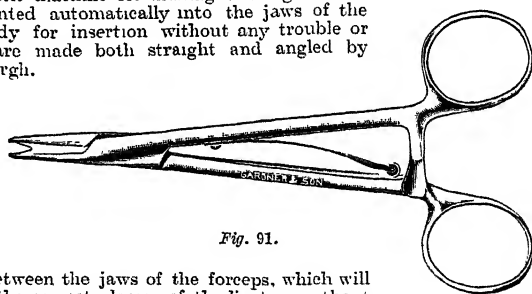


Fig. 91.

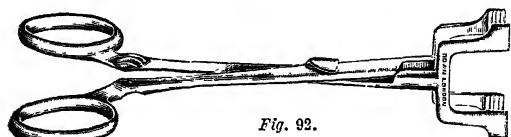


Fig. 92.

forceps (Fig. 93) is used for clamping the vagina in Wertheim's operation and is a modification of Wertheim's forceps. The following advantages are claimed: (1) Owing to the set and strength of the blades, a strong pressure is exerted along their whole length, thus giving better control of haemorrhage;

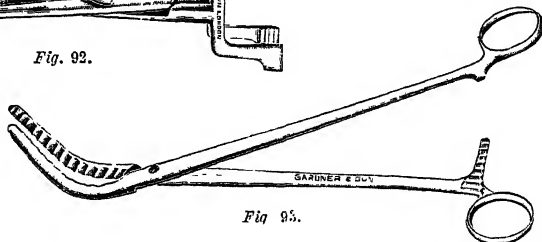


Fig. 93.

or—*Hysterectomy Forceps.*
—Designed by Prof. R. W. Johnstone, of Edinburgh, this uterine

(2) By having the blades placed at a little more than a right angle the forceps is more easily applied; and (3) By using one of these forceps on each side, maximum control of hæmorrhage is obtained. Made by J. Gardner & Son, Edinburgh.

Iris Forceps.—These were made for Lieut.-Colonel P. P. Kilkelly, I.M.S., and the various points of the design are clearly shown in the illustration (Fig. 94). It is thought that the crank tip and fine tooth points will facilitate accurate seizure of the iris at any desired point. They are manufactured in stainless steel by Down Bros. Ltd., London S.E.



Fig. 94.

Ligature Forceps.—The pressure forceps illustrated (Fig. 95), though designed by Dr. Norman Eadie for use especially in tonsillectomy, will be found useful wherever access to a bleeding point is limited. The forceps consists of an ordinary straight pair, provided with a small, smooth hole in one beak as shown. The ligature is threaded through this hole, and the free ends are retained in the clip provided. Having secured the bleeding point, one end of the ligature is withdrawn from the clip and passed round the shank of the forceps to include the other strand of the ligature, making a half-hitch.

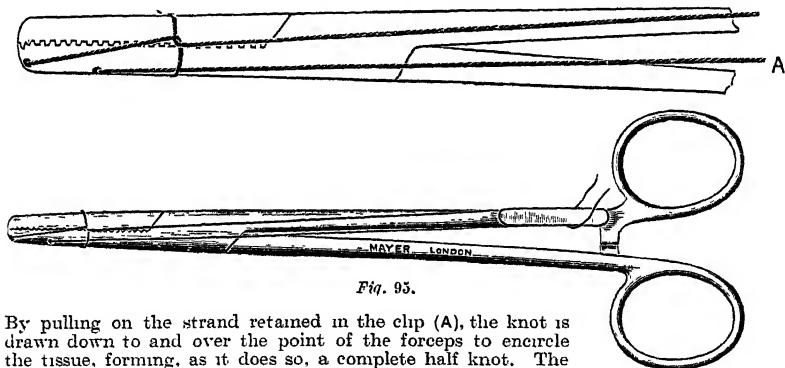


Fig. 95.

By pulling on the strand retained in the clip (A), the knot is drawn down to and over the point of the forceps to encircle the tissue, forming, as it does so, a complete half knot. The strand of the ligature retained in the clip is then released and the forceps withdrawn altogether, or if necessary only partly, when they may be used as a guide to a second knot. Mayer & Phelps, 59-61, New Cavendish Street, W.1., are the manufacturers.

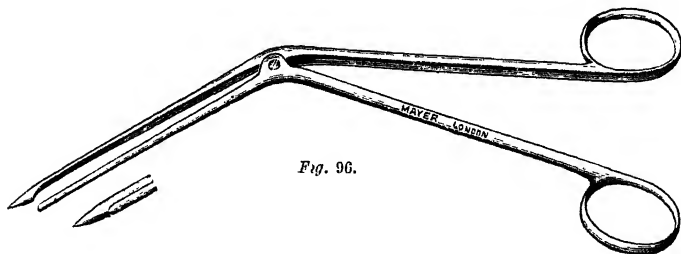


Fig. 96.

Peritonsillar Forceps.—Dr. Wylie exhibited these forceps (Fig. 96) at the Laryngological Section of the Royal Society of Medicine. He said he had used the instrument for two years. No knife is required: the forceps are easy to manipulate when the mouth is almost clenched, and they are easily opened. The handle is constructed so that the operator's hand does not obstruct the view of the throat. Mayer & Phelps, New Cavendish Street, W.1., are the manufacturers.

Ureter Forceps.—These forceps (*Fig. 97*) have been devised by Mr. Andrew Fullerton, F.R.C.S.I., for holding up and steadying the ureter during operations on the latter, such as the removal of calculi and retroperitoneal catheterization. They inflict no damage, and are light and easy to manipulate. The forceps will be found useful for many other purposes such as steadying the common bile-duct, the appendix, and the spermatic cord

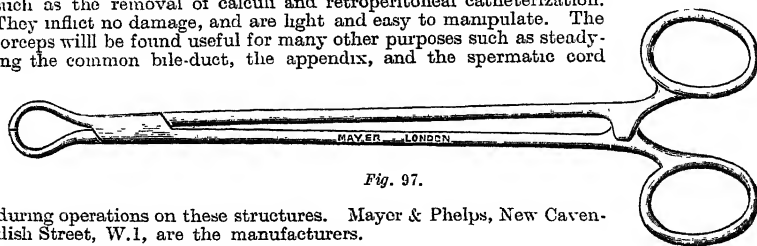


Fig. 97.

during operations on these structures. Mayer & Phelps, New Cavendish Street, W.1, are the manufacturers.

Fulsellum Forceps.—These are designed by Mr. H. C. Donald, F.R.C.S., of Paisley, and are constructed with two teeth on one jaw which fit into a ring on the other jaw of the forceps (*Fig. 98*). This enables a portion of tissue to be folded into the ring, and the teeth do not catch when being inserted into the cervix. The instrument does not tear, and lacerations and scarifications are thus avoided. It is made in stainless or nickel-plated steel by Chas. F. Thackray, Park Street, Leeds, and 119, High Holborn, London, W.C.1.

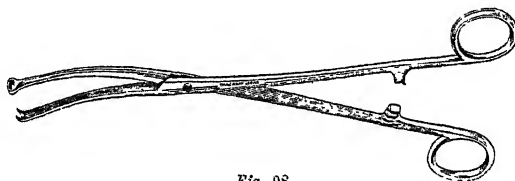


Fig. 98.

Combined Instruments.—The two instruments illustrated have been designed by Mr. R. L. Spittel, F.R.C.S., of Colombo, in furtherance of the aim that whenever possible neither the gloved hand nor whatever comes in contact with it (such as swabs, ligatures, needles, or the working ends of instruments) should be permitted to touch the open wound. He finds that the instrument best adapted to an assistant is one that combines



Fig. 99.

the properties of a forceps and a cutting instrument. Two such types have been devised: (1) A forceps and knife combined (*Fig. 99*), in which a removable blade is slipped on to a special device at the end of a Lane's dissecting forceps. It should be held with the edge of the knife looking in the direction of the finger tips. (2) A scissors and forceps combined (*Fig. 100*) in which the forceps is made as an extension of the bows. It should be held with the fingers in the loops, but more in the manner of a forceps

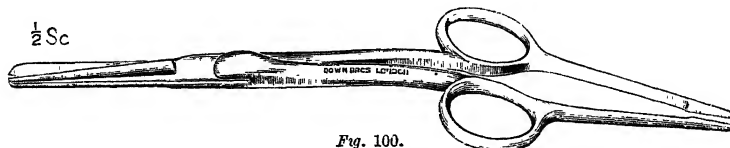


Fig. 100.

than a scissors, and with the convex surface towards the palm so that the forceps ends project out. When thus held, the same grip ensures its easy use either as scissors or forceps. With either of these two instruments an assistant can pick up a mop for swabbing, adjust wound edges, hold a running ligature taut, or cut a ligature. They are made by Down Bros. Ltd., 21 & 23, St. Thomas's Street, S.E. 1

Gastrectomy Clamp.—The illustration (*Fig. 101*) shows a twin stomach clamp which is a simplified form of the Schoemaker twin clamp and is intended for use in hemisphincterectomy, Billroth I, or in the modified operation described by Mr. H. S. Souttar in the *British Medical Journal*, March 19, 1927. This stomach clamp, originally made for Mr. Souttar at the London Hospital, is now manufactured in a slightly improved form by Down Bros. Ltd., London, S.E.



Fig. 102.

Infant's Feeding Spoon.—The need for a better form of spoon for the feeding of small infants has been long felt, and Dr. E. A. Barton has designed a spoon (*Fig. 102*) which seems to fulfil all requirements, in that there is no chance of spilling the contents round the child's mouth during feeding. It is also particularly useful in cases of prematurity or hare-lip. This is made by Mayer & Phelps, New Cavendish Street, W.1.

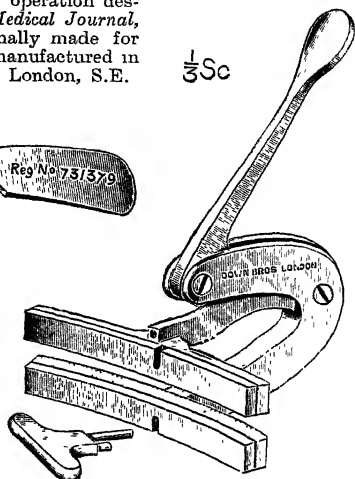


Fig. 101.

Inflation Apparatus.—The illustration (*Fig. 103*) shows a simple apparatus designed by Dr. James Young, Edinburgh, for testing the patency of the Fallopian tubes. It consists of a 20-c.c. Record syringe with special stop-cock, manometer, and uterine

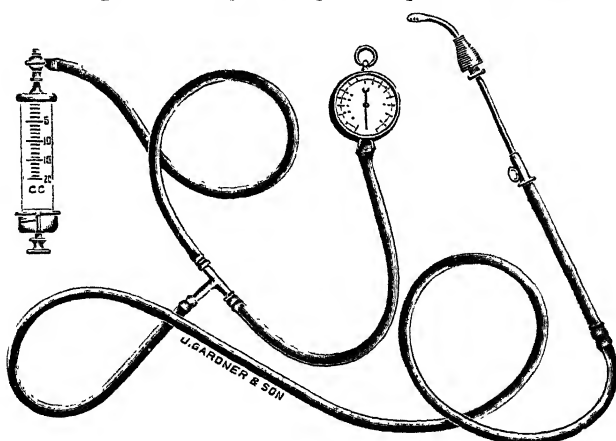


Fig. 103.

tube with rubber flange. This is a modification of Macomber's apparatus, doing away with the necessity of oxygen cylinders, etc., and making the whole apparatus extremely portable. It is made by J. Gardner & Son, Edinburgh.

Inhaler (Chiron Chloroform).—This inhaler (*Fig. 104*) was designed to render it impossible to pump out liquid either by wrongful attachment of bellows or by overfilling. There are no valves to get out of order. It matters not to which tube the bellows are attached: if to A¹, on pumping, the liquid is driven from the bottle A through the connecting tube C into bottle B, and vapour through the outlet tube B¹. If the bellows are attached to B¹, the action is reversed. The danger of overfilling is entirely eliminated because the apparatus can only be charged in an inverted position, and as the

liquid in each bottle reaches the level of the top of the funnel no more can possibly be poured in, so that not more than a specified quantity can be in the apparatus at any time. Manufactured by Mayer & Phelps, New Cavendish Street, W.1.

Inhaler for Nitrous Oxide,

Ether, etc.—The illustration (Fig. 105) shows the most recent form of apparatus (mentioned in our last issue) devised by Dr. Ivan W. Magill for the above methods of anaesthesia. It provides for the administration of nitrous oxide, oxygen, chloroform, ether, and carbon dioxide, either separately or in variable combination. The anaesthetic can be administered by means of open or closed inhalation, or by endotracheal insufflation. The apparatus is roughly a dosimetric one, since the depression of $\frac{1}{4}$ in. of water represents 120 gallons of nitrous oxide per hour, and two 'holes' of oxygen with this amount of nitrous oxide is equivalent to 10 per cent of oxygen. The apparatus

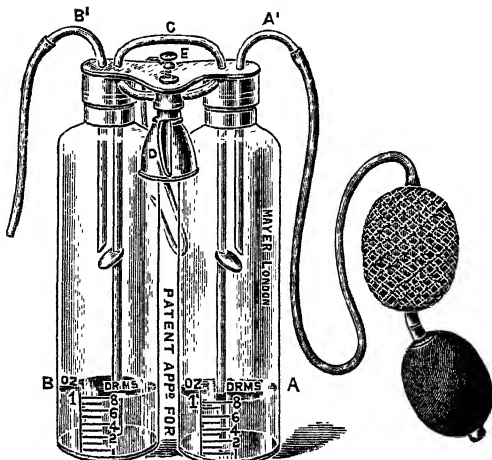


Fig. 104.

was fully described by Dr Magill in *The Lancet*, Aug. 20, 1927. The makers are Down Bros. Ltd., London, S.E.

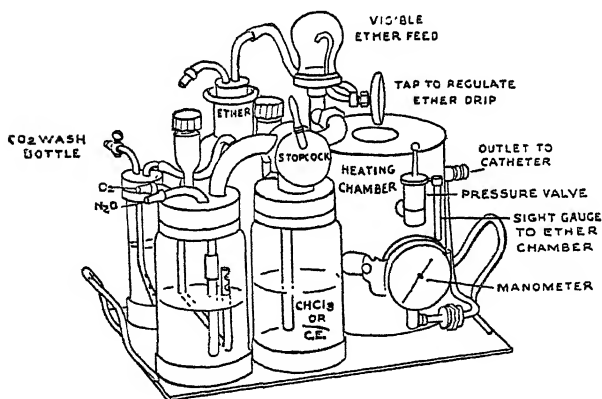


Fig. 105.

loss for blades in good condition and ready for use. The price of the complete set is 25s.

Knives with Slip-on Blades.

An aseptic case (Fig. 106) consisting of two knife handles, with one dozen spare assorted slip-on blades. The advantage of aseptic knife handles with interchangeable and replaceable blades cannot be over-estimated, as an ample supply is always to hand and the practitioner is therefore never at a

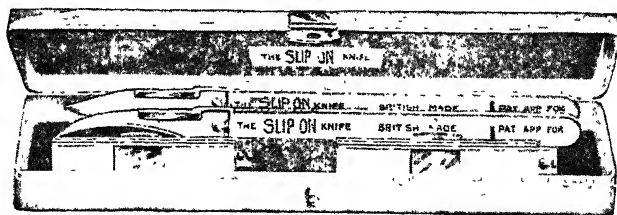


Fig. 106.

from R. Sumner & Co. Ltd., Liverpool. The case and its entire contents are manufactured in Great Britain. We strongly recommend it our readers.

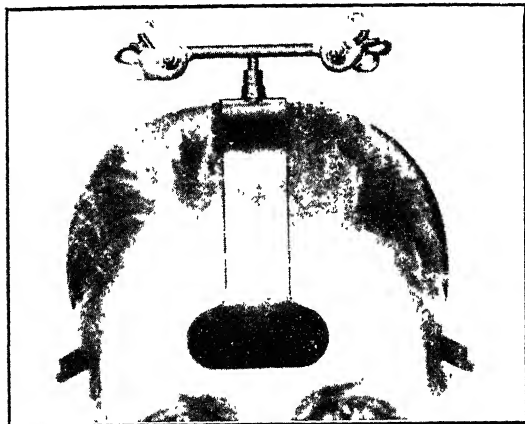


Fig. 107.

ment of the bulb is so much in evidence that it interferes at times very materially with the details one desires to see. The only instrument of the kind in which this feature has been to a certain extent eliminated was one by a Continental maker, but it had a very decided fault—that the focus was much too close. Mr. Dennis Browne, F.R.C.S., suggested one which would project a circle of light 2 to 3 in. in diameter at a distance of about 12 in. without showing any image of the filament. Provision was also to be

Labyrinth (Models of the).—Models of the labyrinth (King's College Hospital pattern), a specimen of which is shown in the illustration (Fig. 107), have been made for purposes of investigating labyrinthine diseases and for teaching students. Mr. A. H. Cheate, C.B.E., F.R.C.S., and Mr. V. E. Negus, M.S., F.R.C.S., have made it possible to reproduce these models so as to render them available for clinical work. Mayer & Phelps, New Cavendish Street, W.1, are the manufacturers, from whom all particulars can be obtained.

Lamp (The 'Davon' Head).—The fault of nearly all existing head lamps is that an image of the fila-

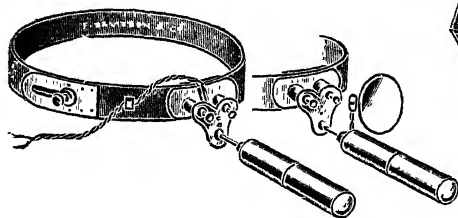


Fig. 108.

made for a mirror to be placed in position so that observers could watch the details of operation. The accompanying illustration (Fig. 108) shows such a lamp made by F. Davidson & Co., 143-149, Great Portland Street, W.1, to Mr. Browne's suggestion, and it is wonderfully efficient for the purpose intended. Instruction can be imparted to and appreciated by students when they can watch the actual details of operation. Two or three can watch at the same time what is being done. The price is £3 2s. 6d. complete, or £2 15s. without the mirror.

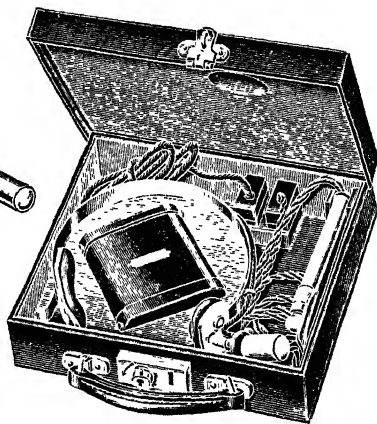


Fig. 109.

The 'Reality' Head lamp (Fig. 109) has been designed to provide a neat portable apparatus for diagnostic examination. It consists of a nickel-plated sprung band with padded leather grips and an adjustable head light with bulls'-eye adjustable lens. Cords and plugs fit into a dry battery of standard size for which refills are easily obtained. There is also a throat examination lamp with tongue spatula attached, which is operated from the same battery. The above contents are contained in a

convenient sized leather-covered case, price 42s. This outfit is obtainable from Chas. F. Thackray, Park Street, Leeds, and 119, High Holborn, W.C.

Ligature and Needle Box.—An exceedingly handy method of carrying needles and ligatures in a midwifery or an emergency bag. The box (*Fig. 110*) has a double lid, of which the top part can be separately taken off by a rotatory movement, and in the intervening space needles can be carried. The body of the receptacle is for a hank of silkworm gut. The sides, like the lid, are double, the inner one having two slots

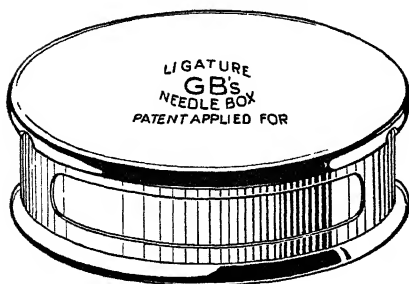


Fig. 110.

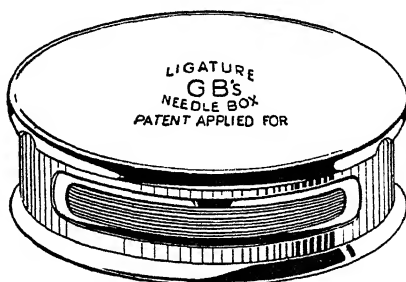


Fig. 111.

through which the ligature is drawn. The outer wall rotates on the inner wall and has an opening. When the ligatures are to be used the opening is turned round until opposite the ligature (*Fig. 111*), the quantity required is drawn out, then the sides are rotated to cover the ligature again. Price 8s. 6d. (ligatures extra) from R. Sumner & Co. Ltd., Liverpool.

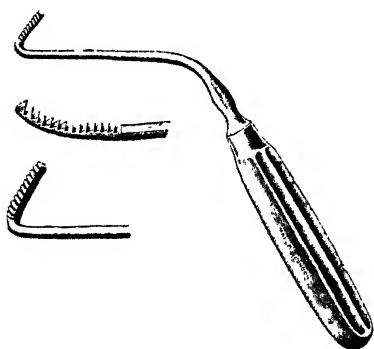


Fig. 112.

Maxillary Antrum Rasps.—Mr. Alban Evans has devised two rasps, forward and backward cutting respectively, which he has found most useful for opening up the maxillary antrum beneath the inferior turbinate bone in cases of empyema. The first is a modification of Dr. Watson-Williams' instrument for the intranasal operation on the frontal sinus. In both due consideration has been given to the angles between the inner wall of the antrum and the anterior and posterior boundaries. The rasps, as shown in the illustration (*Fig. 112*), were made by Mayer & Phelps, New Cavendish Street, W.1, several years ago, and Mr. Evans states that they have been used in a great number of cases with satisfactory results.

Measuring Tape.—With an ordinary tape the degree of muscular wasting, etc., cannot be measured at all accurately because the tension used is not constant. With this instrument (*Fig. 113*), the spring is always drawn out just to the stop; this gives

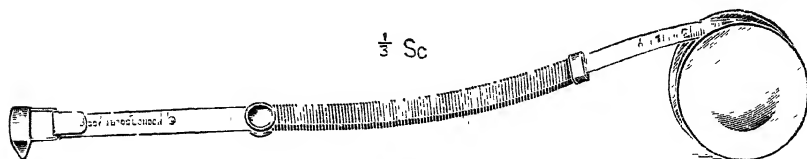


Fig. 113.

a constant tension to one end of the spring. The weight of the spool is equal to the extending force; thus, the other end of the tape may be given the same tension. The

instrument enables past, present, and future measurements to be compared with great accuracy. This is designed by Dr. F. C. Eve, of Hull, and made by Down Bros. Ltd., London, S.E.

Needles for Hernioplasty.—The use of these needles will be understood from the illustrations (Figs. 114, 115). A, Tail end of fascial strip, to which is attached a thread with ordinary round-bodied needle for the fixation stitch. B, Fascial strip, which need only be 4 in. long, taking in varying amounts of aponeurotic fibres. C, Loop thread with fascial blunt-ended needle, specially devised to push its way through aponeurotic tissues without cutting the fibres. The loop thread is

attached by turning one end of the fascial strip over the thread and tying off by a stitch, which also pierces the fascial strip. If more than one suture is required, the loop end is fastened off by the fixation stitch of the next suture, and so on. This combination of thread fascia is easy to work with, as fascia is a slippery tissue and is not easy to manipulate by previously described methods. Mayer & Phelps, New Cavendish Street, W.1, are the manufacturers.

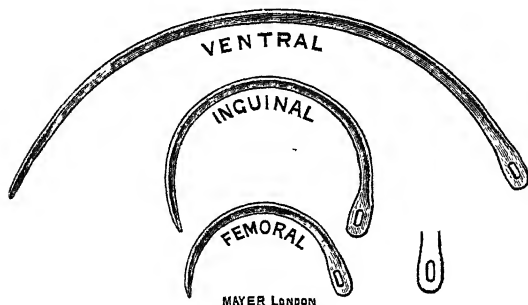


Fig. 114.

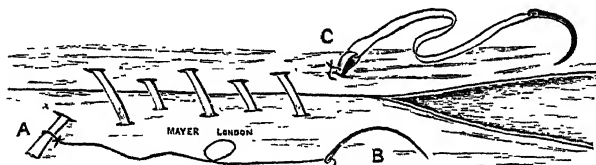


Fig. 115.

'Queenetty' Protector.—This is an entirely new device for ladies, worn as a supplement to the towel. It consists of two thin pieces of celluloid which fasten round each thigh by means of an adjustable elastic garter, the adjustment ensuring an instant fit for either a stout or thin patient. A second elastic strap running up the outer side of the leg at right angles to the former is secured to the corset or waist band, keeping the whole thing securely in place.

On each side of the celluloid is a soft, thin, absorbent gauze pad, the outer one to prevent the celluloid from touching the skin of the thigh; the inner, being in contact with the pad or towel, absorbs any blood or discharge. Each of these gauze pads can be detached instantly and thrown away when soiled, its place being taken by a new 'refill.' The celluloid can, if necessary, be cleaned with soap and water. Their combined weight, with straps and all, is under 3 oz., and owing to their flexibility they conform to any movement, and when in position their presence cannot be felt.

Briefly, it affords a complete protection for the inner aspect of a woman's thighs when wearing a vulval pad. The chafing and irritation caused to many women by the prolonged use of a sanitary towel is very great, but this appliance not only prevents any discharge from reaching the skin, but also prevents the towel itself from coming in contact with the skin. This appliance is supplied by Alexander & Fowler, 104-6, Pembroke Place, Liverpool.

Rectum Plug (The 'Donovan').—This is a great improvement upon the ordinary rectum plug. It is hollow, with a receptacle in which ointment can be placed and by means of a screw can be forced through small perforations in the plug. The parts are therefore not only held apart but are lubricated by the appropriate medicament. The advantage is obvious, and immediate relief is given to the patient. The Donovan Surgical Co., "Teviot," Longbridge Road, Barking, are the manufacturers.

Radium Wax-knife (Electric).—Radium when applied at a distance from the skin in operable and post-operative cancer work, according to the principles of Regaud, of Paris, and other Continental workers, is supported by means of wax moulds fitting over the part. The construction of these involves considerable manipulation, and to facilitate this the electric wax-knife has been designed by Drs. A. B. and S. M. Smith. The wax-knife is kept constantly hot by means of an electrical resistance surrounding the upper part of the blade. The current (240 volts) is obtained from the ordinary room supply through an insulated wire with socket. The illustration (*Fig. 116*) shows the instrument in use. It can be obtained from the Medical Supply Association Ltd., 167, Gray's Inn Road, London, W.C.

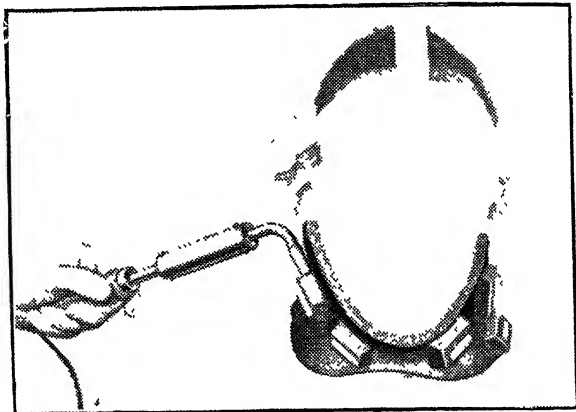


Fig. 116.

Rubber Gloves ('Imperial').—These gloves are manufactured in England by an entirely new method, from liquid latex of the rubber tree that has not been allowed to solidify. The gloves are made therefore from the actual sap, and hold all the original properties and strength of the natural rubber, in comparison with the usual process of manufacture that involves the milling and breaking down of the coagulated rubber into solution, thereby seriously impairing its qualities. The liquid rubber is vulcanized before the gloves are actually made, and over- and under-vulcanization is impossible. Considerable durability is gained by this process over the old 'steam' and 'cold' cure methods that are apt to affect their vitality. The surface of the roughened glove is unique, and stands out as a distinct advance over existing gloves, its natural feel creating a firm and deft touch. The gloves are specially recommended for use in the colonies, as they will be found to withstand the effects of any climatic conditions, and to resist light to an extraordinary degree. The gloves are super-sterilizable, and therefore accomplish great economy compared with existing makes. They are supplied by Chas. F. Thackray, Park Street, Leeds, and 119, High Holborn, W.C.1.

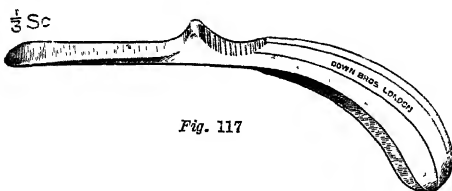


Fig. 117

Rugine.—An unusual design of rugine for bone surgery is here shown (*Fig. 117*), the handle of which affords a powerful and comfortable grip. It has been made by Down Bros. Ltd., 21 & 23, St. Thomas's Street, London, S.E.

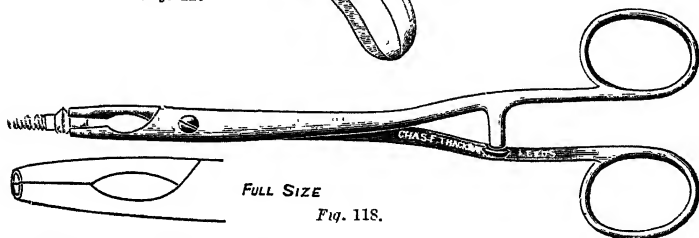


Fig. 118.

Screwdriver for Ox-bone Plates.—Cunningham's ox-bone plates fixed with bone screws are now largely supplanting metal plates in the operative treatment of fractures.

The insertion of a bone screw differs in several respects from that of a metal screw, the former requiring more finesse of technique. After the bone has been bored with a drill, the resulting cavity is 'tapped.' It is then ready for the reception of the bone screw. For the purpose of inserting this screw the forceps-screwdriver (*Fig. 118*) is of the greatest possible assistance. The readiness with which this instrument can be disengaged prevents the disappointment caused by the thread of the screw becoming broken in endeavouring to release the ordinary screw-holder. This instrument was designed by Mr. Hamilton Bailey, F.R.C.S., and is made by Chas. F. Thackray, Park Street, Leeds, and 119, High Holborn, W.C.1.

Sensation Tester.—The needle of this instrument (*Fig. 119*), being mounted in a

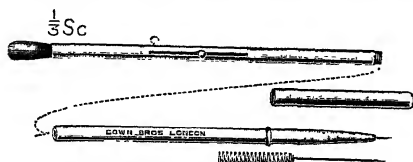


Fig. 119.

is designed by Dr. F. C. Eve, and made by Down Bros. Ltd., St. Thomas's Street, S.E.

long spring, gives the same stimulus for protopathic sensibility each time—even if repeated after a month or a year. A group of three or four pricks should be given at each spot. The camel's-hair brush has parallel fibres which always bend to the same force when pushed lightly against the skin, or the skin may be lightly stroked for testing epicritic sensibility, preferably after shaving the skin, if hairy. This

Septum Needle.—The illustration (*Fig. 120*) shows a hollow septum needle with a stainless steel tube. Hollow needles are frequently employed in submucous resection of the nasal septum as being the easiest type to use in the limited space available. The length, depth of curve, and funnel-shaped end of the needle have been adopted by Dr. Ross Souper after repeated trials to find the most suitable form. The makers are Down Bros. Ltd., London, S.E.



Fig. 120.

Sponge Rubber for Surgical Use.—The advantage of sponge rubber over air-inflated articles is very apparent. It is practically indestructible, and there is a total lack of danger of puncture. Mats for operating tables covered with cut sheet rubber as illustration (*Fig. 121*) can be supplied in any size, and satisfactorily form part of a well-equipped operating theatre. Invalid cushions covered with red cut sheet rubber hold the advantage over air-inflated cushions of having no valves to manipulate. They never deflate, nor do they lose size as on the inflation of air cushions. Pessaries with and without spring, and face pads for Hewitt's and Clover's inhalers, are also made, and emphasize the usefulness of sponge rubber for surgical purposes. A circular with reference to these products can be obtained from Chas. F. Thackray, Old Medical School, Leeds.

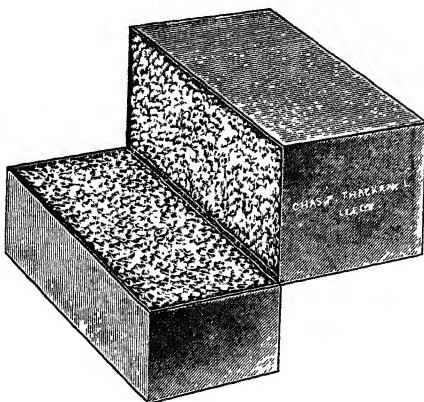


Fig. 121.

Stand for Cylinders (New Portable).—A small stand (*Fig. 122*) for gas cylinders which can be carried in the surgeon's bag has been devised by Dr. Ivan W. Magill. It is claimed that it is simple in construction and can be readily clamped or hung to

a convenient table or chair, or placed on the floor, and supports the cylinders in a tilted position. The makers are Down Bros. Ltd., 21 & 23, St. Thomas's Street, S.E.

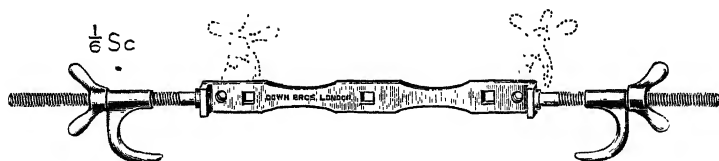


Fig. 122.

Stereo Loupe (The 'Davon').—This is a decided improvement on existing types of loupes for corneal examination. As will be seen (*Fig. 123*), it takes the form of a spectacle frame, with adjustable curl sides to admit of its being worn low down on the nose. The observer is thus able to look over as well as through it. The lenses are sphero-prisms with the bases together, and the frame is of solid nickel. Altogether it is a wonderfully comfortable thing in use. It was suggested by Mr. Bishop Harman, F.R.C.S., and is made by F. Davidson & Co., 143-149, Great Portland Street, W.1.

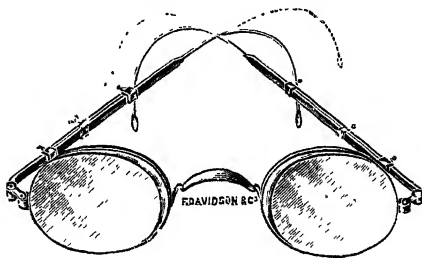


Fig. 123.

Sterilizers (Electric).—The new 'Reality' electric sterilizers (*Fig. 124*) have a greatly improved device for cutting off the electric current in the event of the sterilizer boiling dry. The principle is mechanical and thereby ensures long life and certain action. The sterilizers are

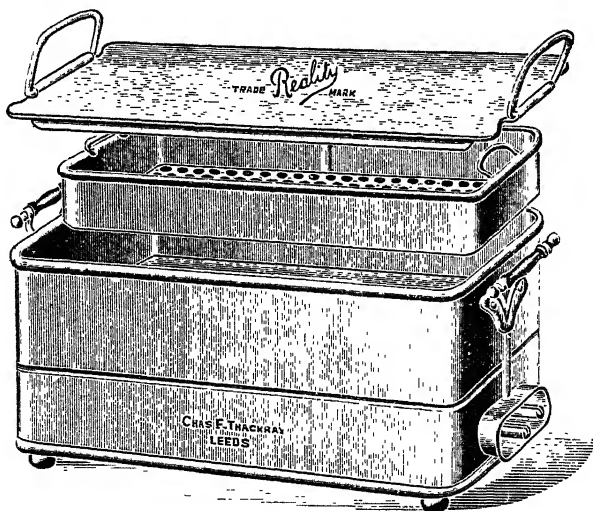


Fig. 124.

British made throughout, soundly constructed of stout metal, and guaranteed for one year. A range of most useful sizes for surgeons and hospital use is available, but any size can be made to order. Full particulars of sizes and prices on application to the sole agent, Chas. F. Thackray, Park Street, Leeds, and 119, High Holborn, W.C.1.

Surgical Bridge.—A surgical bridge (*Fig. 125*) has been designed by Dr. Stuart Tidey to prevent centrifugal tension at the periphery of ulcerated surfaces. It is fastened over

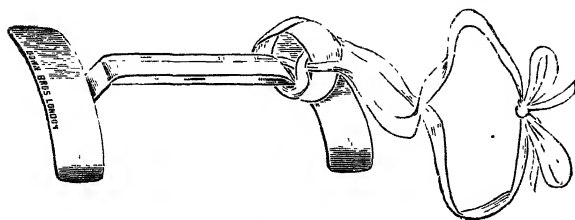


Fig. 125.

the ulcer in such a way as to relieve all tension, and, although made of aluminium and very light and easily cleaned, is strong enough to support the pull of the bandages which hold it in position and are wound over the bridge to protect the damaged tissue. The

appliance is made by Down Bros. Ltd., 21 & 23, St. Thomas's Street, S.E.

Syringe for Blood Transfusion.—The illustration (*Fig. 126*) shows a large syringe (1 pint) for blood transfusion designed by Mr. R. R. Macintosh, F.R.C.S., and used at Guy's Hospital. It is intended for the citrate method, 2 drachms of sterile saturated solution of sodium citrate being drawn in through the needle before the collection of blood. The syringe will act as a sterile container for blood, and the following advantages are claimed for the apparatus: (1) Small quantity of excipient used; (2) The

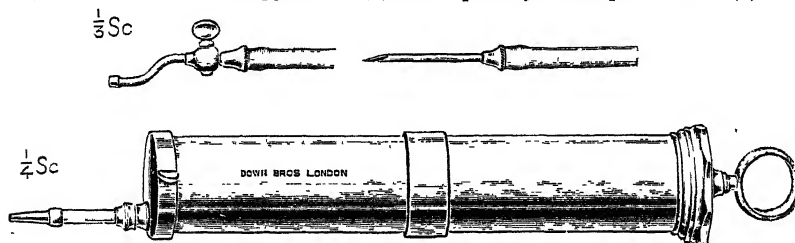


Fig. 126.

blood is the whole time enclosed in a sterile container; (3) Ease and quickness of sterilization—an autoclave unnecessary; (4) Elimination of multiple 'gadgets'; (5) Skilled assistance is not essential; (6) Transportability; (7) Ease of insertion of small needle diminishes the number of times the vein of recipient has to be cut down on. The makers are Down Bros. Ltd., 21 & 23, St. Thomas's Street, London, S.E.

Syringe for Cisterna Puncture.—When a needle has entered the cisterna, fluid does not always flow immediately, especially if the patient is sitting up, and the spring syringe (*Fig. 127*) has been designed by Dr. F. C. Eve to fill itself directly fluid is struck, thus avoiding the temptation of pushing on the needle. The makers are Down Bros. Ltd., London, S.E.

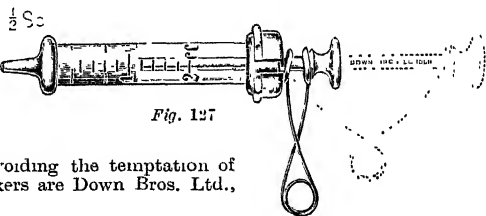


Fig. 127

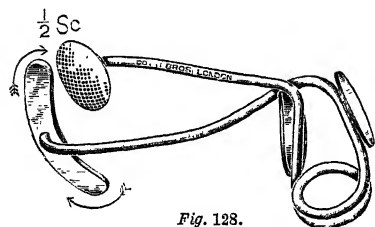


Fig. 128.

Tonsil Compressor.—We illustrate here a new tonsil compressor (*Fig. 128*) devised by Dr. H. Ross Souper, of Aberdeen. It is intended for use during the operation of tonsillectomy, and the spring handle is shaped so that it is not in the way while the second tonsil is being removed. Down Bros. Ltd., 21 & 23, St. Thomas's Street, S.E., are the makers.

Trial Frame.—The trial frame which Dr. J. A. Parry Price recommends to his

colleagues after a year's trial, will probably interest surgeons who have to do work amongst school children. The details of the frame are shown in the illustration (*Fig. 129*), and it will be noted that it can be readily fitted to the various sizes and shapes of the head, and when once fitted can be retained firmly in position. The makers are Down Bros. Ltd., 21 & 23, St. Thomas's Street, S.E.

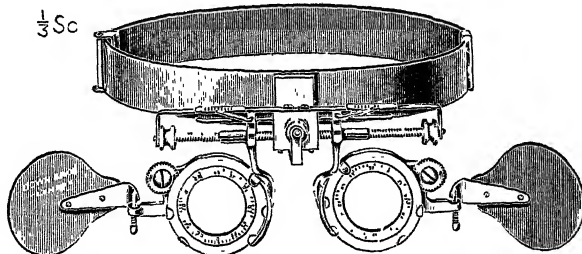


Fig. 129.

Urine Testing.—Under the name of the 'Urolyt' case Reynolds & Branson Ltd., of Leeds, have provided a means of rapidly testing a specimen of urine for sugar or albumin at the patient's bedside or on the consulting-room table. The test for albumin consists in adding a drop of Esbach solution to a drop of urine on a glass slide. For sugar, a mixed drop of the Fehling's solutions is boiled on a glass slide, and then a drop of urine is added. The heat is supplied by a pellet, which is burned in a little spoon provided.

A small, very portable box (*Fig. 130*) contains the reagents, glass rods, slides, litmus paper, etc., packed in a very convenient manner. It is an economical and expeditious way of satisfying oneself concerning the condition of the urine and can be carried out during the consultation, which is a great advantage. The small size, which is ample for all ordinary purposes, costs 15s.



Fig. 130.

Vaporizer.—Maw's Drip-feed Lamp is a safe and economical apparatus for vaporizing a liquid drop by drop. It is automatic in action, and needs no attention beyond refilling. It practically eliminates risk of fire, as the vaporant is not heated in bulk. The heat can be regulated and the speed of vaporization controlled. The apparatus is valuable in the treatment of bronchitis, influenza, asthma, colds, hay-fever, and whooping-cough, and all diseases of the respiratory tract.

Messrs. Maw also supply a scientifically prepared compound of cresols and aromatic essential oils for use with the drip-feed lamp. The vapour it produces is highly antiseptic, soothing, and penetrating, without being unpleasant or nauseating. They call it 'Aero-Cotarol.' (S. Maw, Son & Sons, Ltd., 7-12, Aldersgate Street, E.C.1.)

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Tue Brook Villa, Liverpool, E. Res. Med. Supt., John Murray Moyes, M.B., Ch.B., D.P.M. Tue Brook station, $\frac{1}{2}$ mile, or Green Lane car. *See also Advt., p. 109*

London.—*Bethlem Royal Hospital,* Lambeth Road, S.E.1. Phys. Supt., J. G. Porter Phillips, M.D., F.R.C.P. (Bakerloo) Lambeth North Station

See also Advt., p. 93

Brooke House, Clapton, E. 5. Res. Med. Supt., Dr. Gerald Johnston. Clapton, G.E.R.

Camberwell House, 33, Peckham Road. S.E.5. Res. Med. Supt., H. J. Norman, M.B., Ch.B., D.P.H.

See also Advt., p. 107

Chiswick House, Chiswick, W.4. Res. Med. Supt., Douglas Macaulay, M.D. Chiswick station, $\frac{1}{2}$ mile; Turnham Green station, 1 mile. *See also Advt., p. 92*

Clarence Lodge, Clapham Park, S.W. 4. Prop., Mrs. F. Thwaites. Med. Off., Dr. Percy Smith. Clapham Road, and Clapham Common (Electric), 15 minutes. Tel. No. 0494 Brixton.

See also Advt., p. 106

Featherstone Hall, Southall (for ladies). Res. Med. Lic., A. N. Leatham, M.R.C.S., L.R.C.P. Southall station, 5 minutes.

Fenstanton, Christchurch Road, Streatham Hill, S.W. Res. Med. Supt., J. H. Earls, M.D. Tulse Hill, 5 minutes; Streatham Hill, 10 minutes.

See also Advt., p. 108

Flower House, Catford, S.E.6. Med. Supt., Wm. F. Unney, M.D. Res. Lic., Colonel Walter & Beckett. S.E. & C. Rly., Beckenham Hill, 5 minutes.

Halliford House, Upper Halliford, Shepperton, S.W. Res. Med. Supt., W. J. H. Haslett, M.R.C.S. Sunbury station, 1½ miles.

Hanwell Mental Hospital (L.C.C.), Southall. Res. Med. Supt., A. W. Daniel, M.D. Hanwell, G.W.R., 1 mile.

Hayes Park, Hayes, Middlesex. Res. Med. Off., Dr. H. F. Stilwell. Hayes, 2 miles.

Hendon Grove Asylum (for ladies), Hendon, N.W. 4. Med. Lic., Dr. H. R. S. Walford. By L.M. & S.R., Hendon station, ½ mile.

See also Advt., p. 92

Horton Mental Hospital (L.C.C.), Epsom. Med. Supt., Lt.-Col. J. R. Lord, C.B.E., M.D., F.R.C.P.E. Epsom, S.R., 1½ miles; Epsom Town, 1½ miles.

London County Council, The Manor, Epsom. Res. Med. Supt., Dr. E. S. Littelljohn. S.R. and L.B. & S.C.R., 1½ miles.

London County Mental Hospital, Banstead Downs, near Sutton, Surrey. Res. Med. Supt., Dr. A. A. W. Petrie. Belmont station, ½ mile; Sutton station, 1½ miles.

London County Mental Hospital, Bexley, Kent. Res. Med. Supt., G. Clarke, M.D. Bexley station, S.R., 1½ miles.

London County Mental Hospital, Cane Hill, Coulsdon, Surrey. Res. Med. Supt., Lt.-Col. S. C. Elgee, O.B.E., L.R.C.P. & L.R.C.S. (I.). Coulsdon South or Coulsdon North (S. Rly.), 10 minutes.

London County Mental Hospital, Claybury, Woodford Bridge, Essex. Med. Supt., G. Foster Barham, M.D. Woodford station, G.E.R., 1½ miles.

See also Advt., p. 109

London County Mental Hospital, Colney Hatch, N.11. Res. Med. Supt., S. J. Gillfillan, O.B.E., M.A., M.B., C.M. New Southgate, L. & N.E.R.

London County Mental Hospital, Long Grove, Epsom. Res. Med. Supt., D. Ogilvy, M.D. Southern Rly.

London County Mental Hospital, West Park, Epsom. Res. Med. Supt., Norcliffe Roberts, O.B.E., M.D.

Mead House, Hayes (for ladies). Med. Licensees, Dr. H. F. Stilwell and Dr. R. J. Stilwell.

Moorcroft House, Hillingdon, Uxbridge, 2 miles. Med. Licensees, Mr. J. F. Stilwell, Dr. R. J. Stilwell and Dr. G. W. B. James. West Drayton station, 2 miles.

Newlands House, Tooting Bec Common, S.W.17. Private Mental Hospital for a limited number of ladies and gentlemen. Phys. Supt., Dr. Noel Sergeant. Balham station, 1 mile; Trinity Road Station (Underground), ½ mile. Motor bus Nos. 49, 49a, 49b, and 19a. *See also Advt., p. 105*

Northumberland House, Green Lanes, N.4. Res. Med. Supt., Frederick Dillon, M.D. Finsbury Park stations (Underground & G.N.), ½ mile.

See also Advt., p. 94

Otto House, 47, North End Road, West Kensington (for ladies). Lic. Prop., Mrs. Sutherland. Lady Supt., Miss Brodie. West Kensington station, 1 mile.

Peckham House, 112, Peckham Road, S.E.15. Props., A. H. & H. G. Stocker. Res. Med. Supt., Dr. F. R. King. Peckham Rye station, 10 minutes' walk.

See also Advt., p. 92

Springfield Mental Hospital, Tooting, S.W. 17. Med. Supt., R. Worth, O.B.E., M.B., B.S. Wandsworth Common station, 1 mile.

St. Luke's Hospital for Mental Diseases (re-building). (Offices, 19, Nottingham Place, W.) *See also Advt., pp. 62 and 66*

The Priory, Roehampton, S.W., 15. Res. Med. Supt., James Chambers, M.D. Barnes station, 10 minutes.

West Ham Mental Hospital, Goodmayes, Essex. Res. Med. Supt., Dr. James Harvey Cuthbert. Goodmayes, 1 mile.

Wood End House, Hayes (ladies). Med. Lic., Dr. R. J. Stilwell and Dr. G. W. B. James. Hayes station, 1 mile; Uxbridge, 3 miles.

Wyke House, Isleworth, Middlesex. Res. Phys., G. W. Smith, O.B.E., M.B., Ch.B. (Edin.). Isleworth and Osterley stations, 1 mile.

See also Advt., p. 97

Londonderry.—*District Asylum*. Res. Med. Supt., John Watson, M.C., M.B., B.Ch. Londonderry, 1 mile.

Macclesfield.—*Cheshire County Mental Hospital*, Parkside. Res. Med. Supt., H. Dove Cornua, M.B., M.S., D.P.M. Macclesfield, 1 mile.

See also Advt., p. 108

Maidstone.—*Kent County Mental Hospital*. Res. Med. Supt., H. Wolseley-Lewis, F.R.C.S., M.D. Maidstone West, 1½ miles.

Malling Place, West Malling, Kent. Res. Med. Supt., Dr. G. H. Adam. Malling station, 1 mile.

Market Lavington (Wilts.).—*Fiddington House*. Med. Supt., J. R. Benson, F.R.C.S. Vis. Med. Off., Dr. Morecom-Harnes. Res. Licensee, The Rev. E. Benson. Lavington, G.W.R., 1 mile; Devizes, 6 miles.

See also Advt., p. 103

Maryborough (Queen's County).—*District Mental Hospital*. Res. Med. Supt., Dr. Pierce Grace. Maryborough, ½ mile.

Melrose, N.B.—*Roxburgh, Berwick, and Selkirk District Asylum*. Res. Med. Supt., Patrick Steele, M.D. Melrose, 1 mile.

Melton (Suffolk).—*St. Audry's Hospital for Mental Diseases*. Res. Med. Supt., W. Brooks Keith, M.C., M.D. Melton station, $1\frac{1}{2}$ miles; Woodbridge station, $2\frac{1}{4}$ miles.

Menston (near Leeds).—*West Riding Mental Hospital*. Res. Med. Supt., S. Edgerley, M.D. Guiseley, L.M. & S. 1 mile.

Merstham (Surrey).—*County Mental Hospital*, Netherne, near Coulsdon. Med. Supt., Dr. P. C. Coombes. Coulsdon station, 2 miles.

Middlesbro' (Yorks).—*St. Luke's Hospital*. Res. Med. Supt., Dr. H. G. Drake-Brockman. Middlesbro', 2 miles.

Monaghan (Ireland).—*District Mental Hospital*. Res. Med. Supt., Dr. T. P. Conlon. Monaghan, $\frac{1}{2}$ mile.

Montrose, N.B.—*The Royal Asylum*. Res. Med. Supt., C. J. Shaw, M.D. Hill-side, $\frac{1}{2}$ mile; Dutton, 1 mile.

Morpeth.—*Northumberland Mental Hospital*. Res. Med. Supt., Guy R. East, M.D., D.P.H. Morpeth station, 1 mile.

Mullingar.—*District Mental Hospital*. Res. Med. Supt., Dr. Laurence Gavin. Mullingar station, 1 mile.

Newcastle-on-Tyne.—*City Mental Hospital*, Gosforth. Res. Med. Supt., H. D. MacPhail, M.D. Newcastle, 4 miles.

Northampton.—*Berrywood Mental Hospital*. Res. Med. Supt., Dr. F. J. Stuart. L.M. & S. (L. & N.W.) station, $2\frac{1}{2}$ miles; L.M. & S.R. (Mid.), 3 miles.

St. Andrew's Hospital, Northampton. Res. Med. Supt., D. F. Rambaut, M.A., M.D. Station, 1 mile. *See also Advt., p. 95*

Norwich.—*Bethel Hospital for Mental Diseases*. Res. Med. Supt., S. J. Fielding, M.B. Cons. Phys., Saml. J. Barton, M.D. Norwich (Thorpe) station, 1 mile.

See also Advt., p. 101
City of Norwich Mental Hospital, Hellesdon, near Norwich. Res. Phys. and Supt., Dr. David Rice. Hellesdon, 1 mile.

Heigham Hall, Norwich. Res. Med. Prop., J. G. Gordon-Munn, M.D., J.P. Res. Phys., Dr. G. Stevens Pope, J.P. Thorpe station, $1\frac{1}{2}$ miles.

Norfolk County Mental Hospital, Thorpe, Norwich. Res. Med. Supt., O. G. Connell, M.C., L.R.C.P. & S. Whitlingham, 1 mile; Norwich, $2\frac{1}{4}$ miles.

The Grove, Old Catton, near Norwich (for ladies). Vis. Phys., S. Barton, M.D. Apply to the Misses McLintock.

Nottingham.—*City Asylum*, Mapperley Hill. Res. Med. Supt., G. L. Brunton, M.D. Nottingham, 2 miles.

Notts County Mental Hospital, Nottingham. Res. Med. Supt., S. L. Jones, M.R.C.S. Radcliffe-on-Trent, 2 miles.

The Coppice, Nottingham. Res. Med. Supt., David Hunter, M.B. (Camb.). L.M. & S.R. station, $2\frac{1}{2}$ miles; L. & N.E.R. station, $1\frac{1}{2}$ miles. *See also Advt., p. 96*

Omagh (Co. Tyrone).—*District Asylum*. Res. Med. Supt., Dr. J. Patrick. Omagh, 2 miles.

Oxford.—*County and City Mental Hospital*, Littlemore. Res. Med. Supt., T. S. Good, O.B.E., M.A. (Oxon.), M.R.C.S., L.R.C.P. Littlemore station.

The Warneford, Oxford, $1\frac{1}{2}$ miles. Res. Med. Supt., Alex. W. Neill, M.D. Oxford station $2\frac{1}{4}$ miles. *See also Advt., p. 98*

Paisley.—*Craw Road Asylum*. Vis. Med. Off., H. C. Donald, F.R.C.S. Res. Med. Off., Miss Jessie H. Harkness, M.B. Ch.B. Paisley, 1 mile.

Paisley Mental Hospital, Riccartbar. Res. Med. Off., Dr. Mary R. Knight. Paisley West, $\frac{1}{2}$ mile.

Renfrew District Asylum, Dykebar, Paisley. Res. Med. Supt., R. D. Hotchkis, M.D. Paisley, $2\frac{1}{2}$ miles.

Perth.—*District Asylum*, Murthly. Res. Med. Supt., Lewis C. Bruce, M.C., M.D. Murthly station adjoins the Asylum.

James Murray's Royal Mental Hospital, Perth (for patients of the middle and upper classes). Phys. Supt., W. D. Chambers, M.A., M.D., F.R.C.P.E. Perth station, under 2 miles.

Plympton.—*Plympton House*, Plympton, Devon. Res. Props., Dr. Alfred Turner and Dr. J. C. Nixon. Plympton, 1 mile; Marsh Mills, 2 miles; Plympton, 5 miles. *See also Advt., p. 105*

Portsmouth.—*City Mental Hospital*. Res. Med. Supt., Thomas Beaton, O.B.E., M.D., B.S. (Lond.), M.R.C.P. Clerk and Steward, John C. Kersey. Fratton, $1\frac{1}{2}$ miles. *See also Advt., p. 97*

Prestwich (near Manchester).—*County Mental Hospital*. Res. Med. Supt., Dr. D. Blair. Prestwich, $\frac{3}{4}$ mile.

Rainhill (nr. Liverpool).—*County Mental Hospital*. Res. Med. Supt., Dr. E. F. Reeve. St. Helens, $2\frac{1}{2}$ miles; Rainhill, 1 mile.

Rotherham (Yorkshire).—*The Grange*, 5 miles from Sheffield (for Ladies). Res. Phys., G. E. Mould, M.R.C.S., L.R.C.P. Grange Lane station, L. & N.E.R., $\frac{1}{2}$ mile. *See also Advt., p. 102*

St. Albans.—*Herts County Mental Hospital*, Hill End. Res. Med. Supt., Dr. W. J. T. Kimber. Hill End station, L. & N.E.R. (G.N. Section), 3 minutes.

Napsbury Mental Hospital (under the Middlesex County Council), near St. Albans, Herts. Res. Med. Supt., Arthur O'Neill, O.B.E., M.R.C.S., L.R.C.P. Napsbury, L.M. & S.R., 5 minutes' walk,

St. Leonards-on-Sea.—*Ashbrook Hall*, Hollington (for ladies). Res. Lics., Mr. and Mrs. Charles E. H. Somerset. Warrior Square station, 2 miles.

Salisbury.—*Laverstock House*, Salisbury. Med. Supt., J. R. Benson, F.R.C.S., L.R.C.P. Res. Asst. Med. Off., Dr. Dickenson. Salisbury, 1½ miles. *See also Advt., p. 103*
Old Manor Mental Hospital, Salisbury. Med. Supt., Dr. S. E. Martin. Salisbury station, S.R. and G.W.R., 5 minutes.

See also Advt., p. 106

Shrewsbury.—*Salop Mental Hospital*, Bicton Heath. Res. Med. Supt., W. S. Hughes, M.B., B.S. Shrewsbury, 2½ miles.

Sleaford.—*Kesteven Mental Hospital*. Res. Med. Supt., I. R. Macphail, L.R.C.P. & S. Rauceby, L. & N.E.R., ¼ mile.

Sligo.—*District Mental Hospital*. Res. Med. Supt., Dr. P. O'Doherty. Sligo, 1½ miles.

Stafford.—*County Mental Hospital*. Res. Med. Supt., B. H. Shaw, M.D. Stafford, 1 mile.

Coton Hill Mental Hospital, Stafford. Res. Med. Supt., R. MacDonald, M.D. Stafford, 1 mile.

Stirling.—*District Mental Hospital*, Larbert. Med. Supt., R. B. Campbell, M.D. Larbert, 1½ miles.

Stone (near Aylesbury).—*Bucks Mental Hospital*. Res. Med. Supt., H. Kerr, M.D. Aylesbury, 3½ miles. *See also Advt., p. 104*

Talgarth.—*Mid-Wales Counties Mental Hospital*, Res. Med. Supt., Dr. F. Drummond Talgarth, 1 mile.

Tamworth (Staffs.).—*The Moat House* (for ladies). Res. Licensees, Lt.-Col. C. E. Hollins and Mrs. S. A. Michaux. Med. Attendant, Dr. Lowson. Tamworth station, ¾ mile. *See also Advt., p. 108*

Taunton.—*Somerset & Bath Mental Hospital*, Cotford, near Taunton. Res. Med. Supt., Dr. H. T. S. Aveline. Norton Fitzwarren station, 2 miles.

Ticehurst (Sussex).—*Ticehurst House*. Res. Med. Supt., C. F. F. McDowall, M.D. Wadhurst, 4 miles, or Ticehurst Rd., 3 miles.

Virginia Water.—*Holloway Sanatorium*, Hospital for the Insane, St. Ann's Heath. Res. Med. Supt., Henry Devine, O.B.E., M.D. Asst. Med. Offs., T. E. Harper, L.R.C.P., C. Rutherford, M.B., Elizabeth Casson, M.D., and R. A. MacNab, M.B. Virginia Water station, 5 minutes. Seaside Branch, *St. Ann's*, Canford Cliffs, Bournemouth. Med. Off., C. G. Cowie, M.D. *See also Advt., p. 99*

Wadsley (near Sheffield).—*South Yorkshire Mental Hospital*. Res. Med. Supt., W. J. N. Vincent, C.B.E., M.D. Wadsley Bridge, 1 mile; Sheffield, 4 miles.

Wakefield.—*West Riding Mental Hospital*. Res. Med. Supt., Prof. J. Shaw Bolton, M.D. Kirkgate and Westgate stations, 1 mile.

Wallingford (Berks.).—*Berkshire Mental Hospital*. Res. Med. Supt., Dr. Walter Woolfe Read. Cholsey, 1 mile.

Warlingham (Surrey).—*Croydon Mental Hospital*. Res. Med. Supt., H. M. Berncastle, M.R.C.S., L.R.C.P. Upper Warlingham, 3½ miles.

Warrington (Lancs.).—*Lancashire County Mental Hospital*, Winwick. Res. Med. Supt., F. M. Rodgers, O.B.E., M.D. Warrington, 2½ miles.

Waterford.—*Bon Sauveur Mental Home*, Carriglea, Dungarvan, Co. Waterford. (For ladies.) Conducted by the Order of Bon Sauveur. Vis. Phys., Dr. J. C. Hackett. Dungarvan station, 3½ miles.

District Mental Hospital, Waterford. Res. Med. Supt., Dr. Alexis FitzGerald. G.S. & W.R., North station, 2 miles.

St. Patrick's Private Mental Hospital, Belmont Park, Waterford. (For the treatment and cure of mentally afflicted gentlemen.) Conducted by the Brothers of Charity. Superior, Rev. Bro. Regulus Bourke. Vis. Physicians, Dr. M. Coghlan and Dr. V. Coghlan. Waterford station, 1 mile.

See also Advt., p. 100

Wells.—*The Mental Hospital*, Wells, Som. Res. Med. Supt., Dr. J. McGarvey. Wells station, S. & D.J.R. and G.W.R., 1½ miles.

Whittingham (near Preston).—*County Mental Hospital*. Res. Med. Supt., Dr. R. M. Clark. Whittingham station, 3 minutes.

Winchelsea (Sussex).—*Peritau House*, near Hastings (for ladies). Physician, Harvey Baird, M.D. Winchelsea station, 1 mile.

Woking (Surrey).—*County Mental Hospital*, Brookwood. Res. Med. Supt., J. A. Lowry, M.D. Brookwood station, 1½ miles.

Worcester.—*County & City Mental Hospital*, Powick. Res. Med. Supt., Dr. H. F. Fenton. Worcester station, 4 miles.

York.—*Bootham Park Registered Hospital*, York. Res. Med. Supt., G. R. Jeffrey, M.D. York station, 1 mile.

See also Advt., p. 100

The Friends' Retreat, York. Res. Med. Supt., H. Yellowlees, O.B.E., M.D. York station, 1½ miles.

The Pleasaunce, York (ladies only). Phys. Supt. and Res. Licensee, L. D. H. Baugh M.B. York, 1½ miles.

North Riding of Yorkshire Mental Hospital, Clifton, York. Res. Med. Supt., Dr. J. I. Russell. York, 2 miles.

York City Mental Hospital, Fulford, York. Res. Med. Supt., Dr. R. A. Hooper. Naburn, L. & N.E.R., ½ mile.

MENTAL DEFICIENCY ACT, 1913: CERTIFIED INSTITUTIONS AND HOUSES.

Class A.—Certified Institutions. *Class B.*—Institutions approved under Section 37.

Class C.—Certified Houses. *Class D.*—Approved Homes.

BERKSHIRE.

Cumnor Rise, Oxford.—34 females. High-grade feeble-minded. Managers, Committee. Hon. Secretary, Honble P. Bruce, 4, Wellington Place, St. Giles, Oxford. (*Class A.*)

BUCKINGHAMSHIRE.

Winslow Union Workhouse, Winslow.—9 male, 33 female, adults. Feeble-minded and imbecile. Managers, Winslow Board of Guardians. (*Class B.*)

CARMARTHENSHIRE.

Pantglas Hall, Llanfynydd Road, Carmarthen. For females. Supt., Miss M. C. Treharne Jones. (*Class A.*)

CHESHIRE.

Ashton House, 26, Village Road, Orton, Birkenhead. For 40 girls (high grade only from 14 years). Supt., Miss O. M. Wilkinson. (*Class A.*)

Sandlebridge, near Alderley Edge.—371 males and females. Educable mentally defective children under 13 years of age. Managers, Incorporated Lancashire and Cheshire Society for the Permanent Care of the Feeble-Minded. Sec., E. M. Richards, 72, Bridge Street, Manchester. (*Class A.*)

CUMBERLAND.

Durran Hill House, Carlisle.—65 females. Feeble-minded. Higher grade. Sec., Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (*Class A.*)

DERBYSHIRE.

Whittington Hall, Whittington, near Chesterfield.—400 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control, 14, Howick Place, Victoria Street, S.W. 1. (*Class A.*)

DEVON.

Stoke Lyne, Withycombe, Exmouth. For 50 males. Managers, Devon County Council, Supt., Miss H. E. Darlington. (*Class A.*)

Western Counties Institution, Starcross—485 males and females (trainable children). Sec. Supt., C. W. Mayer. (*Class A.*)

DORSET.

Mount Tabor, Lower Parkstone.—Church of England institution for 18 females over school age. Supt., Sister Mary Frances. (*Class A.*)

DURHAM.

Monkton Hall Home for Lads, Jarrow-on-Tyne.—79 males. Sec., J. Stewart, 90 Pilgrim Street, Newcastle. (*Class A.*)

ESSEX.

Bigods Hall, R. C. Special School, near Dunmow.—61 males. Corresponding Manager, Rt. Rev. Mgr. Wm. O'Grady, St. George's, Walthamstow, E. 17. (*Class A.*)

Brunswick House, Mistley. For males. Supt., S. E. Dudley. (*Class A.*)

Etloe House, Church Road, Leyton.—102 high-grade feeble-minded females, over 16. Corresponding Manager, as for Bigods Hall. (*Class A.*)

Royal Eastern Counties Institution, Colchester.—1200 males and females, all grades. Managers, The Board of Directors. Address communications to the Medical Superintendent. (*Class A.*)

The Mutual Sanatorium, Billerica.—54 males of the middle class. Managers, The Mutual Sanatoria Ltd. (*Class A.*)

Walsham How Home, 1, Forest Rise, Walthamstow, E.17. For 42 females. Supt., Miss Stephens. (*Class A.*)

GLOUCESTERSHIRE.

Brentry Certified Institution, Westbury-on-Trym, Bristol.—300 males. Res. Supt., T. R. Lambert; Med. Off., Dr. Ormerod. Clifton Down, Redland, or Patchway stations, 3½ miles. (*Class A.*)

St. Mary's Home, Painswick, near Stroud.—29 females. High-grade feeble-minded. Apply, Lady Supt. (*Class A.*)

Stoke Park Colony, Hanham Hall, Hanham, near Bristol.—240 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (*Class A.*)

Stoke Park Colony, Royal Victoria Home, Horfield.—42 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (*Class A.*)

Stoke Park Colony, Stapleton, Bristol.—790 patients of both sexes (not exceeding 650 females or 300 males). Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (*Class A.*) See also *Advt.*, p. 68

Stoke Park Colony, West Side, Stapleton.—308 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (*Class A.*)

Stapleton Institution, Bristol.—55 adult males, 95 females and 25 children. Managers, Bristol Board of Guardians. Superintendent, A. F. Waters. (*Class B.*)

Royal Fort Home, Bristol.—20 females, high-grade mentally deficient. Managers, Ladies' Committee. Hon. Sec., Miss G. Savill, 40, Tyndall's Park Road. (*Class D.*)

HAMPSHIRE.

St. Mary's Home, Alton.—45 mentally and morally deficient females. Managers, The Wantage Community of Sisters. (Class A.)

HERTS.

Hillside Special School for Mentally Defective Boys, Buntingford.—40 males. Secretary, Archbishop's House, Westminster, S.W. 1. (Class A.)

St. Elizabeth's Home for Epileptics, Much Hadham.—56 males and females. Apply to Secretary, Archbishop's House, Westminster, S.W. 1. (Class A.)

Boxmoor House School, Boxmoor, Herts.—10 males under 14, and 10 females. Principals, Misses J. M. and M. D. Isbister. (Class C.)

Rowley Lodge, Rowley Green, Barnet.—Educational home for 14 backward boys and girls. Principals, The Misses Wall and Binney. (Class C and D.)

See also *Advt.*, p. 64

KENT.

Princess Christian's Farm Colony, Hildenborough.—78 males, 68 females. Managers, National Association for the Feeble-Minded. Superintendent, Miss Pitman. (Class A and D.)

LANCASHIRE.

Allerton Priory R.C. Special Industrial School, Woolton, Liverpool.—123 male and female educable children. Cor. Manager, Rt. Rev. Mgr. Canon Pinnington. Supt., Sister E. Thompson. (Class A.)

Calderstones, Whalley, near Blackburn.—1127 males, 1306 females. Feeble-minded, imbeciles, idiots, and moral imbeciles. Managers, Mental Deficiency Acts Committee, Lancashire Asylums Board, Preston. (Class A.)

Dovecot Certified Institution, Knotty Ash, Liverpool. For females. Supt., Miss F. Eyre (Class A.)

Pontville R.U. Special School, Ormskirk.—121 boys under 16. Mentally defective. Cor. Manager, Rt. Rev. Mgr. Canon Pinnington, 109, Great Mersey Street, Liverpool. (Class A.)

Royal Albert Institution, Lancaster.—800 of both sexes. Managers, The Central Committee of the Royal Albert Institution, Lancaster. Secretary, Samuel Keir. (Class A.) See also *Advt.*, p. 68

Seafeld House, Waterloo Road, Seaforth, near Liverpool.—235 feeble-minded children. Managers, Guardians of the West Derby Union, Liverpool. (Class B.)

LEICESTERSHIRE.

Leicester Frith, Groby Road, Leicester (with ancillary premises at Cross Corners, 2, Thurcaston Road, Leicester).—Feeble-minded of both sexes. Supt., Miss N. Russam. (Class A.)

LONDON.

39 and 41, *Downs Road, Clapton, E.5.*—50 females. Apply: Sec., Miss E. Walters, 39, Downs Road, Clapton, E. 5. (Class A.)

South Side Home, Streatham Common, S.W.16. For females. Supt., Miss H. G. Hollyer. (Class A.)

The Helping Hand Home, 16, Cathcart Hill, N.—30 females. High-grade mental deficient. Managers, Committee; Hon. Sec., Mrs. Geoffrey Russell, 17, Church Row, Hampstead, N.W. 3. (Class A.)

St. Teresa's, 97, Belmont Hill, Lewisham. For females. Supt., Sister M. Guilmartin. (Class A.)

MIDDLESEX.

All Souls' Special School, Field Heath House, Hillingdon.—120 females. Educable and imbeciles. Manager, T. W. Hunter, Archbishop's House, Westminster, S.W. 1. (Class A.)

Bramley House, Clay Hill, Enfield.—50 females. Managers, Middlesex County Council. Supt., Miss A. Swift. (Class A.)

Crathorne, Oak Lane, East Finchley, N.—20 women, 12 children. Hon. Sec., Mrs. Cannon, Church Army, 57, Bryanston Street, W. 1. (Class A.)

Normansfield, Teddington.—150 males and females of all ages. Med. Supt., Dr. R. L. Langdon-Down. (Class C.)

See also *Advt.* p. 67

The Gables, Upper Teddington Road, Hampton Wick.—20 children (both sexes). Manager, Miss Estor Duncan. (Class C.)

Alexander House, 117, High Street, Uxbridge.—24 females over 16. Supt., Miss E. Collyer. (Class D.)

Conifers, Teddington.—22 females, and 3 male children. Med. Supt., Dr. R. L. Langdon-Down. (Class D.)

Trematon, Teddington.—24 males. Med. Supt., Dr. R. L. Langdon-Down. (Class D.)

NORFOLK.

The Lodge, Bowthorpe Road, Norwich.—6 adult males, 20 adult females. Managers, The Guardians of the Poor of Norwich. Supt., F. R. Smith. (Class B.)

NORTHUMBERLAND.

Prudhoe Hall Colony, Prudhoe.—420, all classes. Managers, Northern Counties Joint Poor Law Committee. Supt., Miss N. M. Hawkes. (Class A.)

NOTTINGHAMSHIRE.

Rampton State Institution, Retford.—Both sexes of violent and dangerous propensities. 441 males, 323 females. Med. Supt., W. R. Thomas, M.D. Managers, Board of Control, 66, Victoria Street, S.W.1. (Class A.)

SOMERSET.

House of Help for Women and Girls, 112, Walcot Street, Bath.—66 feeble-minded fallen women and girls. Lady Supt., Miss F. Hammond. (Class A.)

Stoke Park Colony, Leigh Court, Abbot's Leigh, nr. Bristol.—260 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Rock Hall House, Combe Down, Bath.—18 males, 20 females. Supt., Mrs. O. G. Date. (Class A.) See also *Advt.*, p. 67

Long Ashton Poor Law Institution, Flax Bourton, near Bristol.—32 males, 34 females. Managers, Guardians of the Long Ashton Union. (Class B.)

Yatton Hall, Yatton, near Bristol.—Both sexes. Supt., Miss J. McGill. (Class A.)

STAFFORDSHIRE.

New Cross Poor Law Institution, Mental Walls, Wolverhampton.—4 males. Managers, Wolverhampton Board of Guardians. Supt., T. D. Rollinson. (Class A.)

Poor Law Institution, Dudley, Stafford.—50 males, 60 females. Managers, Guardians of the Dudley Union. Master, P. Hopkin. (Class B.)

The Cloughs, Keble Road, Newcastle-under-Lyme. For males and females. Supt., Miss M. A. Cahill. (Class A.)

SUFFOLK.

Handford Home, Ranelagh Road, Ipswich.—20 high-grade females. Supt., Miss Church. (Class A.)

St. Joseph's Home, The Croft, Sudbury.—20 females. Secretary, Archbishop's House, Westminster, S.W.1. Supt., Sister Veronica Wheelan. (Class A.)

SURREY.

Eagle House, London Road, Mitcham. For females. Supt., Miss M. Blandford. (Class A.)

Royal Earlswood Institution, Redhill.—300 males, 300 females. Med. Supt., Dr. S. Langton. Sec., Mr. H. Stephens, 14, Ludgate Hill, E.C. 4. (Class A.)

See also *Advt.*, p. 67

SUSSEX.

The Hermitage Training Home, Fairwarp, near Uckfield. For females. Supt., Miss M. Walton. (Class A.)

WARWICK.

Agatha Stacey Home, Rednal, near Birmingham.—40 females. The Managers, 158, Broad St., Birmingham. (Class A.)

Midland Counties Institution, Knowle, near Birmingham.—150 males. Supt., S. H. Thornton. Med. Officer, J. O. Hollick, M.B. (Class A.)

Warwick State Institution, The Cape, Warwick.—Females only. Supt., Mrs. G. E. Newsome. (Class A.)

WILTS.

Devises Poor Law Institution.—16 females between the ages of 20 and 50 years. Managers, Devises Board of Guardians. (Class B.)

Poor Law Institution, Semington, near Trowbridge.—6 males, 30 females. Managers, Guardians Trowbridge and Melksham Union. Supt., C. H. Taylor. (Class B.)

WORCESTERSHIRE.

Beesford Court Catholic Mental Welfare Hospital for Children, Beesford, near Defford.—For 119 educable mentally defective boys from 13 to 21 years, and 60 boys from 7 to 13. Res. Manager, The Right Rev. Monsignor T. A. Newsome. (Class A.)

YORKSHIRE.

Meanwood Park Colony, Meanwood, Leeds. 74 males, 110 females. Managers, Leeds City Council. Executive Offices, Mr. S. Wormald, 38, Park Square, Leeds. Matron, Miss C. Surtees Wilson. (Class A.)

Mid-Yorkshire Institution, Whitley, York.—200 males. Managers, The Mid-Yorkshire Joint Board. Supt., Capt. J. Brown, I.S.O. (Class A.)

The Grange, Altofts, Normanton.—15 good class ladies and girls. Mentally deficient, epileptics. Proprietress, Mrs. E. A. Howard. (Class C.)

INSTITUTIONS AND HOMES FOR INEBRIATES.

LICENSED UNDER THE ACTS, 1879-1900.

The patient must sign a Form expressing a wish to enter the Home, before a magistrate. This can be done at the private residence of the patient, or at the retreat, if previous notice has been given. Two friends must also sign a declaration that they consider the patient an 'inebriate' within the meaning of the Acts.

*NOTE—Ecclesfield, Ashford, is a Roman Catholic Religious Institution.

MALES ONLY.

Nuneaton (Warw.).—*Caldecote Hall* (C.E.T.S. Institution). Res. Med. Supt., Alfred E. Carver, M.D. Nuneaton, 2½ miles. See also *Advt.*, p. 90

Rickmansworth (Herts.).—*Dalrymple House.* Apply to Res. Med. Supt., Dr. F. S. D. Hogg. Rickmansworth station, L. & N.E.R. & Metropolitan Rlyw, ½ mile; L. & N.W.R., 1 mile. See also *Advt.*, p. 91

FEMALES ONLY.

*Ashford (Middlesex).**—*Ecclesfield.* Med. Supt., Dr. John H. Reid. Apply, Mother Superior. Ashford station, 1 mile.

Belfast.—*The Lodge Retreat,* Irwin Avenue. Med. Attend., R. W. Leslie, M.D. Matron, Miss R. Clarke. Co. Down line train, 2 minutes' walk; G.N. by tram, 20 minutes.

Beverley (E. Yorks).—*Albion House*. Med. Supt., H. L. Munro, M.D. Hon. Sec., Mrs. T. R. Pentith, Restholme, Sutton, near Hull. Beverley, 1 mile.

Spelthorne St. Mary (Bedfont, Middlesex).—Apply to the Sister Superior,

C.S.M.V. Med. Supt., Dr. Woods. Feltham, S.W.R., 1 mile.

Torquay.—*Temple Lodge* (C.E.T.S. Institution). Res. Supt., Sister in Charge. Med. Off., Dr. E. Catford.

See also *Advt.*, p. 90

UNLICENSED HOMES.

Beckenham (Kent).—*Norwood Sanatorium Ltd.*, The Mansion, Beckenham Park. Beckenham Junction, 10 minutes.

See also *Advt.*, p. 91

Oaklands, 15, The Avenue, Beckenham, Kent. Res. Med. Supt., Francis Hare, M.D. Beckenham Junction, 5 mins. walk.

See also *Advt.*, p. 90

Paignton (Devon).—*Bay Mount*, small private home for both sexes. Res. Med. Supt., Dr. Stanford Park.

See also *Advt.*, p. 90

Woodbridge (Suffolk).—*Norwood Sanatorium Ltd.*, Rendlesham Hall, Woodbridge. Wickham Market station.

See also *Advt.*, p. 91

SANATORIA FOR CONSUMPTION AND OTHER FORMS OF TUBERCULOSIS.

Aberchalder (N.B.).—*Inverness-shire Sanatorium, Invergarry*. Med. Supt., J. Kirton, M.C., M.A., M.D. Aberchalder, 2 miles.

Arosa (Switzerland).—*The Altein Sanatorium*. Res. House. Phys., Dr. H. Heinz. Man. Director, P. Wieland.

See also *Advt.*, p. 79

Sanatorium Arosa, Inner-Arosa. Med. Supt., Dr. E. Jacobi. House Phys., Dr. H. Trenkel.

See also *Advt.*, p. 76

Ascot.—*Farmwood Sanatorium* (for both sexes). Res. Med. Supt., Berkeley N. Ash. M.R.C.S., L.R.C.P. Apply, Secretary. Ascot, 1 mile.

See also *Advt.*, p. xli

Ashford (Kent).—*Grosvenor Sanatorium*, Kennington, near Ashford. Res. Med. Supt., J. A. Milne, M.B., Ch.B., D.P.H. Ashford Junction, 2 miles.

Aysgarth, S.O. (Yorks).—*Wensleydale Sanatorium*. Physicians, D. Dunbar, M.B., B.S., and W. N. Pickles, M.D., B.S. Aysgarth, $\frac{1}{2}$ mile, via Northallerton, L. & N.E.R., and Hawes Junction, L.M. & S.R.

See also *Advt.*, p. 72

Baguley (Cheshire).—*Baguley Sanatorium*. For Manchester cases. Res. Med. Supt., H. G. Trayne M.B., D.P.H. Baguley, $1\frac{1}{2}$ miles.

Banchory (Scotland).—*Nordrach-on-Dee*. Senr. Phys., Ian S. Stewart, M.D. Banchory, $\frac{1}{2}$ miles.

Barrasford (Northumberland).—*The Newcastle-on-Tyne Sanatorium*. Res. Med. Supt., Dr. C. G. R. Goodwin. Barrasford, L. & N.E.R., 4 miles.

Benenden (Kent).—*Sanatorium of "National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis."* Res. Med. Supt., Dr. H. Spurrier. Bidenden, 3 miles.

Bingley (Yorks.).—*Eldwick Sanatorium* (West Riding County Council school for phthisical children). Med. Off., Dr. Margaret S. Sharp. Bingley station, 2 miles.

Birmingham.—*Municipal Sanatorium*, Yardley Road. Res. Med. Supt., Dr. G. B. Dixon. Stechford, L.M.S. Rly.

Romsley Hill Sanatorium. Halesowen, Worcestershire. Res. Med. Supt., Dr. P. J. Bodington. Birmingham Corporation Sanatorium. Halesowen, $4\frac{1}{2}$ miles.

St. Gerard's Orthopaedic Hospital, Coleshill, near Birmingham. For children suffering from tubercular and other joint diseases. Vis. Med. Supt., Bernard E. Wall, M.B. Forge Mills, L.M.S. Rly., 1 mile.

See also *Advt.*, p. 56

Bolton (Lancs.).—*Wilkinson Sanatorium for Consumptives*, Sharples. Med. Off., Dr. J. D. Marshall.

Boston (Lincs.).—*Holland Sanatorium*. Med. Supt., H. C. Jennings, M.B., D.P.H. Boston, 1 mile.

Bournemouth.—*Royal National Sanatorium for Consumption and Diseases of Chest*. Sec., A. G. A. Major. Res. Med. Off., D. A. Hutcheson, M.D. Bournemouth Central, $1\frac{1}{2}$ miles; Bournemouth West, $\frac{1}{2}$ mile.

The Firs Home (for advanced cases of consumption). Hon. Sec., Col. R. F. Anderson. Hon. Treas., A. J. Drewe, Esq. Hon. Med. Offs., C. P. Woodstock, M.D., and S. G. Champion, M.D. Lady Supt., Miss Ingram. Bournemouth Central, $\frac{1}{2}$ mile.

Bovey Tracey (Devon).—*Devon County Sanatorium*, Hawkmoor. Res. Med. Supt., Dr. J. C. Smyth. Bovey, 3 miles; Lustleigh, 2 miles.

Bradford.—*Bierley Hall Sanatorium*, Bierley Lane. For 68 women and children only. Res. Med. Supt., Dr. L. G. White.

Bridge of Weir (Renfrewshire).—*Consumption Sanatoria of Scotland*. Hon. Treas., Lord MacLay, 21, Bothwell Street, Glasgow. Res. Med. Supt., James Crockett, M.D. Bridge of Weir, 2 miles.

Brighton.—*Municipal Sanatorium*, for Brighton townfolk only (pulmonary and joints). Med. Supt., Dr. Duncan Forbes, M.O.H., Town Hall, Brighton. Brighton Central station, $1\frac{1}{2}$ miles.

Bristol.—*Frenchay Park Sanatorium for Bristol Children*, Frenchay, near Bristol. Under the control of the M.O.H. Dept., Bristol. Staple Hill station, L.M. & S. Ry., $1\frac{1}{2}$ miles.

Buttevant (Co. Cork).—*Cork County and City Sanatorium*, Heatherside. Res. Med. Supt., Dr. R. Ahern. Buttevant, G.S. & W.R., 6 miles.

Camberley (Surrey).—*Prior Place Sanatorium*, Heatherside. Res. Med. Supt., Dr. H. O. Blanford. See also *Advt.*, p. 77

Camborne (Cornwall).—*Tehidy Sanatorium*. Res. Med. Supt., Dr. F. Chown. Camborne, 3 miles.

Cambridge.—*Papworth Village Settlement*. Res. Med. Supt., P. C. Varrier-Jones, M.A., M.R.C.S., L.R.C.P. Huntingdon station, 6 miles.

Chagford (Devon).—*Dartmoor Sanatorium*. Res. Med. Supt., Dr. C. H. Berry. Moretonhampstead, G.W.R., 6 miles.

See also *Advt.*, p. 77

Chandler's Ford (Hants.).—*Hants. County Council Sanatorium*. Res. Med. Supt., Dr. W. J. Hart. Chandler's Ford, 1 mile.

Cheltenham.—*The Cotswold Sanatorium*, near Stroud, Glos. Res. Med. Supts., A. H. Hoffman, M.D., and Geoffrey A. Hoffman, M.B. Cheltenham, 8 miles.

Salterley Grange Sanatorium, near Cheltenham. Res. Med. Supt., Dr. D. J. Peebles. Leckhampton, $2\frac{1}{2}$ miles; Cheltenham, $3\frac{1}{2}$ miles.

Darlington.—*Feliz House*, Middleton St. George, Co. Durham. Res. Med. Supt., C. S. Steavenson, M.B. Dinsdale, N.E.R., 3 minutes.

Davos-Platz (Switzerland).—*Sanatorium Schatzalp-Davos*. Res. Med. Supt., Edward C. Neumann, M.D. By funicular from Davos-Platz. See also *Advt.*, p. 79

Park Sanatorium (formerly *Sanatorium Turban*), Davos-Platz. Res. Med. Supt., F. Bauer, M.D. Davos-Platz, 10 minutes.

See also *Advt.*, p. 76

Derbyshire.—*Ashover Sanatorium*, near Chesterfield. Res. Med. Supt., Dr. Stuart E. Gordon. Stretton, L.M. & S.R., $3\frac{1}{2}$ miles; Matlock, 4 miles.

Derbyshire County Sanatorium, Walton, near Chesterfield. Med. Supt., A. N. Robertson, M.D. Chesterfield, $1\frac{1}{2}$ miles.

Devon and Cornwall Sanatorium, Didworthy, South Brent. For consumptives of the two counties. Sec., S. Carlisle Davis, Esq., M.B.E., 5, Princess Square, Plymouth. Res. Med. Off., Dr. A. T. Bettinson. Brent, G.W.R., 2 miles.

Dublin.—*Peamount Sanatorium*, Hazel-hatch, Dublin. Res. Med. Supt., Dr. G. P. H. Sheehan. Lucan, 2 miles.

Dundee (near).—*Sidlaw Sanatorium*, Auchterhouse. 80 beds for children. (In connection with Dundee Royal Infirmary. Med. Supt., H. J. C. Gibson, M.D.). Vis. Phys., W. E. Foggie, D.S.O., M.D., Vis. Surg., L. T. Price, F.R.C.S.E. Matron, Miss Ellen Norris. Sec., Geo. B. Brough. Auchterhouse station, $1\frac{1}{2}$ miles.

Durham.—*Durham County Consumption Sanatoria*. Sec., Mr. F. Forrest, 54, John Street, Sunderland. For men: Stanhope. Med. Supt., John Gray, O.B.E., M.B. Stanhope station, 1 mile. For women and children: Wolsingham. Med. Supt., John Gray, O.B.E., M.B. Wolsingham station, $\frac{3}{4}$ mile.

East Fortune (East Lothian).—*East Fortune Sanatorium*. Res. Med. Supt., Chas. Cameron, M.D. East Fortune, $\frac{1}{2}$ mile.

Edinburgh.—*Royal Victoria Hospital for Consumption*. Under the supervision of Wm. Robertson, M.D., D.P.H., M.O.H., Public Health Dept., Public Health Chambers, Johnston Terrace, Edinburgh.

Farnham (Surrey).—*Crooksbury Sanatorium*. Cons. Phys., F. R. Walters, M.D. Apply, Secretary.

Fortbreda, Belfast.—*Forster Green Hospital for Consumption and Chest Diseases*. Sec., J. Osborne, 99-103, Scottish Provident Buildings, Belfast. Belfast, 2 miles.

Frimley (Surrey).—*Brompton Hospital Sanatorium*. Res. Med. Supt., Dr. R. C. Wingfield. Frimley station, 2 miles.

See also *Advt.*, p. 54

Grange-over-Sands.—*Westmorland Sanatorium*, Meathop. Res. Med. Supt., C. F. Walker, M.D., D.P.H. Grange-over-Sands station, 2 miles.

Harpenden (Herts.).—*Sanatorium of the National Children's Home and Orphanage*. Harpenden station, L.M. & S. Ry. Vis. Phys., T. N. Kelynaek, M.D., J.P. Principal, Rev. W. Hodson Smith, Highbury Park, London, N.5. See also *Advt.*, p. 73

Hastings.—*Fairlight Sanatorium*, in connection with Margaret Street Hospital for Consumption (for Out-Patients), 26, Margaret St., W. Sec., Mrs. M. C. Hawthorne. Med. Off., Dr. N. F. Stallard. Hastings, tram, about 15 minutes.

Heswall (Cheshire).—*Cleaver Sanatorium for Children*. Med. Supt., J. B. Yeoman, M.D. Matron, Miss D. Kelsall. Heswall, $1\frac{1}{2}$ miles.

Hexham (Northumberland).—*Wooley Sanatorium.* Med. Supt., Dr. J. A. R. Paterson.

Hull.—*Hull and East Riding Convalescent Home,* Withernsea. Sec., Benjamin Brooks, Royal Infirmary, Hull Med. Off., A. E. Sproule, L.R.C.P. Withernsea station.

Huntingdon.—*Wytton Sanatorium* (Hunts County Council), for women and children. Med. Supt., C. B. Moss-Blundell, M.D. Huntingdon, 3½ miles.

Ilkley (Yorks.).—*Middleton Sanatorium,* near Ilkley. Res. Med. Supt., T. Campbell, M.D. Ben Rhydding, 1½ miles.

Isle of Wight.—*Royal National Hospital for Consumption,* Ventnor. Med. Supt., Dr. G. Oliver Heipson. Act. Sec., W. H. Garratt, 18, Buckingham St., Strand, W.C. Ventnor, 1 mile. See also *Advt.*, p. 54

St. Catherine's Home Sanatorium, Ventnor (for delicate and pre-tubercular children). Apply Sister-in-Charge. Med. Off., H. F. Bassano, M.A., M.B. Ventnor, 5 minutes.

Kingussie (Inverness-shire).—*Grampian Sanatorium.* Res. Med. Supt., Dr. Felix Savy. Kingussie, ¼ m. See also *Advt.*, p. 75

Kirkcaldy.—*Sanatorium for Tuberculosis.* Med. Supt., Dr. G. W. McIntosh. Res. Med. Off., Dr. Alex. Henderson. Sec., The Town Clerk. Kirkcaldy, 1 mile.

Leeds.—*Leeds Sanatorium for Consumptives,* Gateforth, near Selby; *Leeds Sanatorium for Consumptives,* Killingbeck; and *Leeds Hospital for Consumptives,* Arinley. For poor of Leeds, Sec., C. H. Sedgwick, 37, Great George Street, Leeds.

Leysin-Feydey (Switzerland).—*Station Climatique de Leysin* (Sanatorium Grand Hotel (Dr. Jaquerod), Sanatorium Mont-Blanc (Dr. Piquet), Sanatorium Chamossaire (Dr. Sillig), Sanatorium Belvédère. Leysin-Feydey station, from 1 to 5 minutes. See also *Advt.*, p. 76

Dr. A. Rollier's (Limes, "Les Frénes," Leysin. Helio-Alpine treatment for surgical tuberculosis. See also *Advt.*, p. xlvii

Liverpool.—*Fazakerley Sanatorium.* Res. Med. Supt., C. Rundle, O.B.E., M.D. Fazakerley station, ¼ mile.

Highfield Sanatorium, Knotty Ash, Liverpool. Med. Supt., H. R. Macintyre, D.S.O., M.C., M.D., D.P.H. Knotty Ash, ¼ mile.

Liverpool Sanatorium for Consumptives, Delamere Forest, Frodsham. Sec., W. H. Rayner, Liverpool Hospital for Consumption, Mount Pleasant, Liverpool. Res. Phys., Alfred Adams, M.D. Frodsham, L. & N.W.R., 3½ miles.

Llanybyther (Carmarthenshire).—*West Wales Sanatorium.* The Welsh National Memorial to King Edward VII. Res. Med. Supt., Dr. Henry A. Ross. Llanybyther station, 3 miles.

London.—*City of London Hospital for Diseases of the Heart and Lungs,* Victoria Park, E. 2. Apply, Secretary. Cambridge Heath, L.N.E.R., or Tram, 5 minutes.

Mount Vernon Hospital (Incorporated), Northwood. Res. Phys., Dr. W. G. Kinton. Out-patient department and offices, 7, Fitzroy Square, W. Secretary, W. J. Morton. Northwood (Met. & L. & N.E. Rly.), 1 mile. See also *Advt.*, p. 74

Royal Chest Hospital, 231, City Road, E.C. 1 (Section of the Royal Northern Group of Hospitals). Apply to the Sec.

Manchester.—*Hospital for Consumption and Diseases of Throat and Chest,* Bowdon. Med. Supt., Dr. T. Hanlin; *Crossley Sanatorium,* Delamere, Cheshire. Med. Supt., Dr. G. Heathcote. (For poor and working classes, after personal examination at Manchester.) Sec., C. W. Hunt, Hardman Street, Manchester.

Margate (Kent).—*Royal Sea-bathing Hospital* (for Surgical Tuberculosis). Med. Supt., Dr. Basil Armstrong, M.C. Margate West, ¼ mile. Sec., A. Nash, Watergate House, 15, York Buildings, Adelphi, W.C.2.

Market Drayton (Shropshire).—*Cheshire Joint Sanatorium.* Res. Med. Supt., Dr. Peter W. Edwards. Market Drayton, 4½ miles.

Marple (Cheshire).—*Nab Top Sanatorium,* for residents of Salford only. Res. Med. Off., H. M. Fleming, M.D. Rosehill (Marple) station, ½ mile.

Menai Bridge, Anglesey.—*Penhesgyn-y-Gors Sanatorium* (King Edward VII Welsh National Memorial Association). Med. Off., Dr. Emrys Jones. Matron, S. J. Bennett. Menai Bridge, 3 miles.

Mendip Hills.—*Mendip Hills Sanatorium,* Wells, Somerset. Cons. Phys., Dr. C. Muthu. Wells station, 3 miles.

Nordrach-upon-Mendip, Blagdon, near Bristol. Res. Med. Supt., R. Thurnani, M.D. Burrington station, G.W.R., 4 miles.

Midhurst (Sussex).—*King Edward VII Sanatorium.* Res. Med. Supt., Dr. R. R. Trail. Midhurst, 4 miles.

Murtle (Aberdeenshire).—*Tor-na-Dee Sanatorium.* Res. Med. Supt., Dr. J. M. Johnston. Murtle, ½ mile.

See also *Advt.*, p. 74

Nayland (Suffolk).—*East Anglian Sanatorium* for private patients, *Malings Farm Sanatorium* for poorer men and women patients, and *East Anglian Children's Sanatorium,* Nayland. Med. Supt., Dr. Jane Walker. Bures Station, L. & N.E.R., 3½ miles, Colchester, 8 miles.

See also *Advt.*, p. 74

New Cumnock (Ayrshire).—*Ayrshire Sanatorium,* Glenafton. Res. Med. Supt., E. E. Prest, M.D. New Cumnock, 3 miles.

Norfolk.—*Children's Sanatorium for the Treatment of Phthisis, Incorporated*, Holt. Vis. Med. Off., Dr. H. F. Skrimshire. Hon. Sec., Mrs. C. Munro, Carnegie House, 117, Piccadilly, W.1.

Kelling Sanatorium, Holt. Res. Med. Supt., Dr. J. I. W. Morris. Holt, 1½ miles.

Mundesley Sanatorium, Mundesley. Res. Med. Supts., S. Vere Pearson, M.D., G. Lucas, M.D., and Dr. L. W. Sharp. Mundesley, 1 mile. See also *Advt.*, p. 77.

Selbrigg Sanatorium, Holt. Med. Supt., Dr. J. I. W. Morris. Holt, 1½ miles.

Northampton.—*Northamptonshire Sanatorium*, Creaton. Res. Med. Supt., Dr. C. Milne. Brixworth, L.M.S.R., 3 miles.

Nottinghamshire.—*Ransom Sanatorium* (Notts County Council), Sherwood Forest, Mansfield. Res. Med. Off., Dr. R. R. S. Weatherston. Mansfield, 3 miles.

Nuneaton (near).—*Bramcote Sanatorium*, Bramcote. Both sexes. Med. Supt., Dr. J. McG. Williams. Nuneaton, 3½ miles.

Oban, Scotland.—*Argyll County Sanatorium*, Benavoulin. Vis. Med. Off., Duncan MacDonald, M.D. Oban, 1 mile.

Oldham.—*Strinesdale Sanatorium*. Med. Supt., Dr. J. B. Wilkinson. Oldham, 2 mls.

Peebles.—*Manor Valley Sanatorium*. Med. Off., C. B. Gunn, M.D. Peebles 4 miles; Lyne, 1½ miles.

Penmaenmawr (N. Wales).—*Pendyffryn Hall Sanatorium*. Res. Physicians, Denison Pickering, M.D. (Camb.), and W. D. Sheldrake, M.R.C.S., L.R.C.P. Penmaenmawr, L.M.S.R., 1 mile.

See also *Advt.*, p. 75

Peppard Common (Oxon).—*Berks. and Bucks. Joint Sanatorium*. Res. Med. Off., Dr. Esther Carling. Reading, 6½ miles.

Ringwood (Hants).—*Linford Sanatorium*. Res. Med. Supts., A. de W. Snowden, M.D., Dr. A. G. E. Wilcock, and Dr. C. Cassidy. Ringwood, 2½ miles.

Robertsbridge (Sussex).—*Darvell Hall Sanatorium* (East Sussex County Council). Res. Med. Off., Dr. J. R. Dingley. Robertsbridge, S. Rly., ¾ mile.

Rudgwick (Sussex).—*Rudgwick Sanatorium*. Vis. London Phys., Dr. Annie McCall. Rudgwick station, 7 minutes.

Ruthin (N. Wales).—*Vale of Chwyd Sanatorium, Llanbedr Hall*. Res. Med. Supt., H. Morriston Davies, M.D. Ruthin station, 2 miles. See also *Advt.*, p. 72

St. Leonards.—*Eversfield Chest Hospital*, West Hill. Res. Phys., Dr. E. J. Maxwell. West St. Leonards, S.E.R.; West Marina, L.B. & S.C.R., within 5 minutes' walk.

Sandon, near Chelmsford (Essex).—*Mervale Sanatorium*. Res. Med. Supt., H. N. Marrett, M.R.C.S., L.R.C.P. Chelmsford station, G.E.R., 3½ miles.

Sandy (Beds.).—*The Bedfordshire County Sanatorium*, Mogerhanger Park. Med. Supt., C. G. Welch, M.D.

Sheffield.—*The City Sanatoria*. Crimicar Lane Sanatorium (males); Commonside Sanatorium (females); Winter Street Sanatorium (both sexes); Nether Edge Sanatorium (both sexes and children). Tuberculosis Med. Off., John Rennie, M.D. Sheffield, L.M.S., 4½ miles.

Shirlett, near Broseley (Shropshire).—*King Edward VII Memorial Sanatorium*. Res. Med. Supt., Dr. F. T. Turner. Much Wenlock station, 3 miles.

Skipton (Yorks).—*Eastby Sanatorium for Boys*. Res. Med. Supt., Dr. C. Arnott. Embay station, 2 miles.

Stannington (Northumberland).—*"Philipson" Children's Sanatorium*. Res. Med. Off., Dr. Elsie F. Farquharson. Med. Supt., T. C. Hunter, M.D. Matron, Miss I. Campbell. Stannington stat., 2 miles.

Stonehouse (Glos.).—*Standish House Sanatorium*. Res. Med. Supt., W. A. Dickson, M.D., F.R.C.S. Stonehouse, G.W.R., 1½ miles; ^{Str.} G.R., 2½ miles.

Stourbridge (Worc.)—*Prestwood Sanatorium*. Med. Supt., Dr. J. Stevenson, M.C. Stourbridge, 3 miles.

Swansea.—*Adelina Patti Tuberculosis Hospital*, "Craig-y-nos," Pen-y-cae. Res. Med. Supt., Dr. L. R. Clark. Craig-y-nos, 2 miles.

Threlkeld (Cumberland).—*Blencathra Sanatorium*. Res. Med. Supt., Dr. W. Goodchild. Threlkeld, C.K. & P.R., 2 miles. See also *Advt.*, p. 74

Torquay.—*"Whitecliff" Tuberculosis Hospital*. Med. Supt., Dr. R. G. Riddell. Tuberculosis Off., Dr. E. Ward. Torre station, 2 miles.

Ulverston.—*High Carley Sanatorium* (including Oubas House Children's Sanatorium). Res. Med. Supt., E. H. A. Pask, M.D. Ulverston, 2 miles.

Ware (Herts).—*Hertfordshire County Sanatorium*, Ware Park. Res. Med. Supt., Herbert Sharpe, M.R.C.S., L.R.C.P. Ware, 2 miles; Hertford, 2 miles.

Warrenpoint (Co. Down).—*Rostrevor Sanatorium*. Phys., Dr. J. A. O'Tierney. Apply Secretary.

Whiteabbey (Co. Antrim).—*Belfast Municipal Sanatorium*. Res. Med. Supt., P. S. Walker, M.D., B.Ch., D.P.H.

Wicklow.—*The Royal National Hospital for Consumption for Ireland*, Newcastle, Wicklow. Res. Med. Off., C. Denys Hanan, M.D. D. & S.E.R. to Newcastle, Co. Wicklow, 3 miles.

Winsley, near Bath.—*Winsley Sanatorium*. Res. Med. Off., Dr. J. D. Macfie. Limpley Stoke station, 1 mile.

Woking (Surrey).—*St. Katharine's*, Hook Heath. Med. Supt., A. R. Snowden, M.R.C.S.

Worcester (near).—*King Edward VII Memorial Sanatorium*, Knightwick. Free to County patients. Res. Med. Supt., Dr. H. Gordon-Smith. Knightwick, 1½ miles.

HYDROPATHIC ESTABLISHMENTS.

Baslow (Derbyshire).—*Grand Hotel and Hydro.* Manageress, I. M. Locking. Bake-well, 4 miles; Grindleford, 5 miles.

Ben Rhydding (Yorkshire).—*Ben Rhydding Hydro Hotel Co.* Res. Phys., G. Cooper, M.D. Station, 5 minutes.

Bournemouth (Hampshire).—*Bournemouth Hydropathic.* Res. Med. Supt., W. J. Smyth, M.D. Bournemouth West station, $\frac{1}{2}$ mile.

Bristol.—*The Bristol Hydropathic and Electrotherapeutic Establishment.* College Green. Res. Phys., W. J. Spoor, M.B., M.R.C.S., and A. T. Spoor, M.A., M.R.C.S., L.R.C.P. Temple Meads, $\frac{1}{4}$ miles.

Buxton.—*Buxton Hydro Hotel.* Manager, G. W. Bosworth. Station, 4 minutes. *See also Advt., p. 88*

Cork.—*St. Ann's Hill Hydropathic.* Res. Phys., Dr. R. H. Barter. Blarney, $2\frac{1}{2}$ miles. Cork, 8 miles.

Crieff.—*Strathearn Hydro* (17 miles from Perth). Res. Med. Supt., T. Gordon Meikle, M.B., C.M. Crieff station, 1 mile.

Eastbourne.—*Hydro Hotel.* Eastbourne, 1 mile. Man., W. W. Hornsby.

Forres.—*Cluny Hill Hydropathic.* Vis. Phys., Dr. John C. Adam. Forres station, 1 mile.

Harrogate (Yorkshire).—*Harlow Manor Hydro.* Manageress, Miss Oakley. Harrogate station, 1 mile.

The Cairn Hydro, Harrogate. Apply, Manager.

The Harrogate Hydropathic Lim. Med. Supt., Dr. A. Hunsley-Walker. Man., W. Taylor. Harrogate station, $\frac{1}{2}$ mile.

Hexham (Northumberland).—*Hexham Hydro Lim.* Hexham, 1 mile.

Ilkley (Yorkshire).—*Craiglands Hydro.* Res. Phys., Maurice R. Dobson, O.B.E., M.B., B.S. (Lond.), L.R.C.P., M.R.C.S. (Eng.). *See also Advt., p. 85*

Limpley Stoke (near Bath).—*West of England Hydropathic.* Apply, the Secretary. Limpley Stoke station.

Malvern.—*The Malvern Hydro Lim.* Great Malvern, $\frac{1}{2}$ mile.

Wyche-side Hydropathic, Malvern. Malvern Wells station. G.W.R., $\frac{1}{2}$ mile; Great Malvern station, 2 miles.

Matlock.—*Rockside Hydropathic,* Matlock. Res. Med. Supt., Dr. Marie Goodwin-Orme, M.B.E. Matlock, $\frac{1}{2}$ mile.

Smedley's Hydropathic, Matlock. Res. and Vis. Physicians. Matlock station, $\frac{1}{2}$ mile; omnibus. *See also Advt., p. 83*

Peebles.—*Peebles Hotel Hydropathic.* Resident Physician. L.M.S. and L. & N.E.R. stations, about 10 to 15 minutes' walk.

Southport (Birkdale Park).—*Smedley Hydropathic.* Southport or Birkdale stations. *See also Advt., p. 84*

Hesketh Park Hydropathic, Southport. Telephone: 5155. Telegrams: "Rockley. Southport." *See also Advt., p. 82*

Kenworthy's Hydropathic, Southport. Phys., Drs. A. B. and Irene E. Kenworthy. Chapel Street (L. & Y.). 3 minutes by taxi cab; Lord Street (Cheshire Lines).

Tunbridge Wells.—*The Spa Hotel.* Station about 1 mile. Apply, Manageress. *See also Advt., p. 80*

Ulverston.—*Conishead Priory Hydropathic.* Res. Phys., John Wishart, M.D., D.Sc. Ulverston station, 2 miles.

Watford (Herts.).—*The Stanboroughs Hydropathic Institution.* Res. Physician, W. R. Ruble, M.D. Watford June. L.M.S.R., 2 miles. *See also Advt., p. 80*

West Kirby (Cheshire).—*West Kirby Hydro Hotel.* Telephone: Hoylake 86. Apply, Manageress. *See also Advt., p. 82*

NURSING INSTITUTIONS AND TRAINING INSTITUTIONS FOR NURSES.

London.—*Cavendish Temperance Male Nurses' Corporation Lim.*, 54, Beaumont St., W.1; 23, Upper Baggot St., Dublin; 28, Windsor Terr., Glasgow; and 176, Oxford Rd., Manchester.

See also Advt., p. 64

Heywood Trained Nurses' Association, 30, Porchester Square, Hyde Park, W.2. Apply, Matron. *See also Advt., p. 65*

Male Nurses' Association, 29, York Street, Baker Street, W.1. Sec., W. J. Hicks. *See also Advt., p. 63*

New Mental Nurses' Co-operation, 139, Edgware Road, Marble Arch, W.

See also Advt., p. 61

St. Luke's Hospital. Trained Nurses for Mental and Nervous Cases. Lady Supt., 19, Nottingham Place, W.1; also at 57, Clarendon Road, Leeds.

See also Advt., p. 62

The Nurses' Association, 29, York Street, Baker Street, W.1. Sec., W. J. Hicks; Supt., Mrs. Millicent Hicks.

See also Advt., p. 63

PRIVATE HOMES FOR INVALIDS, MATERNITY HOMES, INSTITUTIONS FOR SPECIAL CARE AND TREATMENT.

Aberdeen.—*Balgownie House Nursing Home*. Functional nervous disorders, etc. (both sexes). Matron, Miss Weir.

See also Advt., p. 69

Alderley Edge (Cheshire).—*The David Lewis Colony* (for sane epileptics), and *Colthurst House School* (for epileptic boys and girls). Res. Director, Alan McDougall. M.D. Alderley Edge, 3 miles.

See also Advt., p. 68

Aston, Derby.—*Belvoir Nursing Home*, Functional nervous disorders and convalescents. Apply, Dr. F. M. Douglas-Morris.

See also Advt., p. 70

Bath.—*Lansdown Hospital and Nursing Home*, Bath. Special arrangements for patients suffering from gout, rheumatism, and physical infirmities. Physicians, Dr. Percy Wilde and Dr. Wells-Beville. L.M. & S. or G.W. stations, 1 mile.

See also Advt., p. 61

Broadstone, Dorset.—"*Rizwan*," Blandford Road. For tubercular patients. Apply, Sister Challis.

See also Advt., p. 69

Caterham (Surrey).—*Cedar Grange*. For ladies convalescing from medical, surgical, or nervous diseases. Res. Med. Supt., D. L. Greig, M.R.C.S., L.R.C.P.

See also Advt., p. 69

Clevedon (Somerset).—*Mount Pleasant*, Victoria Road. For ladies suffering from nervous affections, etc. Apply, Mrs. Clarke-Whitfield.

See also Advt., p. 71

Colinsburgh, Fife.—*Kenlaw House*, Functional nervous disturbances (both sexes). Res. Physicians, Dr. W. H. Bryce, Dr. I. D. Suttie, and Dr. J. Suttie. Kilmcuhan station, $4\frac{1}{2}$ miles.

See also Advt., p. 66

Gerrard's Cross (Bucks.).—*Welders*. A home for ladies requiring treatment for neurasthenia and mild mental illness, under the management of St. Luke's Hospital, London. Secretary, 19, Nottingham Place, W.1.

See also Advt., p. 66

Hadlow Down, Uckfield (Sussex).—*South Beacon* (for gentlemen mentally affected, but not ill enough to be certified). Prop., Philip H. Harner. Vis. Phys., C. E. Hedges, M.D. (Camb.). Station. Buxted. Brighton, 22 miles; Eastbourne: 19 miles; Tunbridge Wells, 13 miles. Tel.: 16 Hadlow Down.

See also Advt., p. 64

Harrow-on-the-Hill.—*Bowden House* (for functional nervous disorders). Apply, Medical Superintendent.

See also Advt., p. xlvii

Haslemere (Surrey).—*Haslemere Nursing Home*, "Courtstfold". Medical, convalescent, rest cure, and chronic cases. Apply, Miss Walker. Haslemere (S. Rly.), $\frac{3}{4}$ mile.

See also Advt., p. 71

Hove.—*St. Ann's Electrical Institute*, 39, Brunswick Place, Hove, Brighton. Electrical Treatment, Ultra-Violet Rays, Massage, etc. Apply, Miss Poulter, C.S.M.M.G. Brighton station, $\frac{3}{4}$ mile.

See also Advt., p. 70

Jersey.—*The Firs Private Nursing Home*, Millbrook. Neurasthenia, mental strain, etc. Principal, Mrs. Macdonald.

See also Advt. p. 70

London.—*Heywood Nursing Home*, 30, Porchester Square, Hyde Park, W.2. Apply, Matron.

See also Advt., p. 65

Minerva House, 14, Comeragh Road, West Kensington, W.14. Medical, Surgical, Maternity, and Nerve cases. Apply, Miss Purdy.

See also Advt., p. xxxix

The Radium Institute, 16, Riding House Street, W. Med. Supt., A. E. Hayward Pinch, F.R.C.S.

See also Advt., p. 81

Swedish Institute and Clinique, 108, Cromwell Road, S.W.7. For Medical Gymnastics, Massage, and Electricity. Gloucester Rd. (Dist., Met. and Piccadilly Tube). 'Phone, West 1010.

See also Advt., p. 70

Ruthin, North Wales.—*Ruthin Castle*. Private Hospital for Internal Diseases. Senior Physician, E. I. Spriggs, M.D., F.R.C.P. Ruthin, $\frac{1}{2}$ mile.

See also Advt., p. 1

Sevenoaks.—*The Grey House*. Farm and Garden School for girls needing individual care and an open-air life, with training in indoor occupations. Apply, Mrs. Pearce Clark.

See also Advt., p. 62

St. Leonards-on-Sea.—*The Mount Nursing Home*. Maternity and Convalescent cases. Apply, Miss I. P. Baker.

See also Advt., p. 72

Torquay.—*Ockenden Convalescent Home*. Med. Supt., Eric Catford, M.R.C.S., L.R.C.P. Lady Supt., Miss Glover. Torre and Torquay stations, 1 mile.

See also Advt., p. 64

Watford (Herts.).—*The Stanboroughs*, Medical and Surgical cases. Res. Phys., W. R. Ruble, M.D. Watford Junc., L.M.S.R., 2 miles.

See also Advt., p. 80

PRINCIPAL BRITISH SPAS,

WITH INDICATIONS FOR THEIR THERAPEUTICAL EMPLOYMENT.

THE BRITISH SPA FEDERATION,

(Comprising the Spas of BATH, BUXTON, CHELTENHAM, DROITWICH, HARROGATE, LEAMINGTON, LLANDRINDOD WELLS, STRATHPEFFER, WOODHALL, and NEW ZEALAND.

Bath (Somerset).—Sheltered from N. and N.E. winds by hills from 600 to 800 feet high; 107 miles from London. Climate mild and equable. Bath is at its busiest in the autumn, winter, and spring months, but has an all-the-year-round season. A winter spa is of priceless value to any country, especially to such a country as Britain where, during the winter months, rheumatism in all its forms is particularly prevalent. During the summer there are some complaints in which Bath proves most efficacious.

Waters.—The only hot springs in Britain (120° F.) and the richest natural radio-active mineral waters in this country.

Therapeutic indications.—Specially suitable for all rheumatic and gouty conditions, skin diseases of gouty and rheumatic origin, chronic laryngitis and pharyngitis, and mucous colitis and similar conditions. A detailed list of complaints successfully treated will be sent on application.

Baths.—An extensive and thoroughly equipped bathing establishment. The Queen's Baths and the Royal Baths provide the latest and most approved balneo-therapeutic methods. The Old Royal Baths were opened in 1927 with the latest methods for intestinal douching and treatment by voluntary and controlled movements in the deep pool.

Bath specializes in the treatments for which its waters are particularly adapted: deep baths (500 gallons of natural hot radio-active water), undercurrent douching, douche massage in many forms, and intestinal lavage (Plombières douches), throat sprays and inhalation of the natural radium emanation. Particulars of the many other treatments given will be sent on request by John Hatton, Director of the Spa. Complimentary facilities for treatments and entertainments to practising medical men.

Hotel.—The Pulteney Hotel (*see p. 87*).

Nursing and Baths.—Lansdown Hospital and Nursing Home (*see p. 61*).

(*See also p. xlii.*)

Buxton (Derbyshire).—1000 to 1200 feet above sea-level. The highest town in the United Kingdom; 163 miles from London; 23 miles from Manchester. Served by the London, Midland and Scottish Railway. Sheltered from north and east winds. Very bracing air.

Waters.—Simple, highly radio-active, natural temperature 82° F., mainly bicarbonate of calcium and magnesium ingredients. Tasteless, odourless; also chalybeate springs.

Therapeutic indications.—Gout, rheumatism, rheumatoid arthritis, sciatica, and various nervous diseases, neurasthenia, disorders of digestion, and skin diseases, malaria, mucomembranous colitis, arteriosclerosis, phlebitis, diseases of the throat and air-passages; anæmic conditions, and convalescence from prolonged illness.

Baths.—Establishments, including St. Ann's Well (Pump Room), recently modernized at great cost. Open all the year round. All the latest equipment installed.

Medical Profession, etc.—Complimentary facilities granted to practising medical men.

Hotels and Hydropathic Establishments.—Buxton Hydro Hotel (*see p. 88*), The Old Hall Hotel (*see p. 84*).

Boarding Establishment.—The Buckingham (*see p. 88*).

(*See also p. xlii.*)

Cheltenham (Gloucestershire).—Protected from N. and N.E. winds by the Cotswold Hills; 184 feet above sea level; 101 miles from London. Climate soft and mild. Average rainfall 26 inches. Sunshine 1484 hours.

Waters.—Of four kinds: the Fieldholme or twin salt saline, containing nearly equal parts of magnesium sulphate and sodium sulphate—sold in bottles by chemists, under the name of "Chelspa" aperient water; the Lansdown or sodium sulphate saline, the chief ingredients of which are sulphate and chloride of sodium, closely resembling Kissingen waters; the Pittville or alkaline saline, the only alkaline natural water in Great Britain, very similar in analysis to Carlsbad or Marienbad waters; and the Chadnor or magnesium and calcium saline, containing a large quantity of sulphate of magnesium and a considerable amount of carbonate and sulphate of calcium.

Therapeutic indications.—The Fieldholme water is most useful in gastric hyper-acidity, sthenic dyspepsia, obesity, plethora, chronic constipation, hemorrhoidal conditions, and glycosuria associated with obesity; Lansdown water for anæmic dyspepsias, skin affections, and chronic gastric catarrh; Pittville water for congestion of the liver, torpid liver, biliary catarrh, gastroduodenal catarrh, and gall-stones, also for mucous

colitis, toxæmia, glycosuria, and catarrhal conditions of the intestinal tract; and Chadnor water for renal disorders, lumbago, myalgia, torticollis, and other forms of fibrositis.

Baths.—An excellent set of baths and douche and massage apartments at the Montpellier Baths, close to the Central Spa. All the latest baths and treatment.

Hotel.—Savoy Hotel (see p. 82).

(See also p. xlii.)

Droitwich Spa (Worcestershire).—150 feet above sea level; 2½ hours by express train from London (Paddington), 19 miles from Birmingham, 7 from Worcester. Rainfall 27 inches. Mean winter temperature 44° F., summer 65° F. The climate is excellent for invalids both in summer and winter. Moderately bracing, but well protected from N. and N.E. winds.

Waters.—The most powerful saline in the world. The brine is pumped from the triassic formation 200 feet below the ground level. Temperature 54° F., and is heated by introducing steam. It is 10 times the strength of the ocean (Channel), containing in every gallon 20,000 grains of saline in excess of other European waters: the waters are radio-active and radio-emanative.

Therapeutic indications.—Chronic muscular and articular rheumatism, rheumatoid arthritis, chronic articular or irregular gout, neuritis, sciatica, neuralgia, heart diseases, especially those of myocardium—effect similar and equal to Nauheim treatment, or the Nauheim treatment, on the most approved principles, is given if prescribed—neurasthenia, anaemia, chlorosis, some sclerotic diseases of spinal cord, dry, scaly skin diseases, e.g., chronic eczema and psoriasis. Moist eczema is contra-indicated.

Baths.—Reclining, douche, needle, vapour, swimming, Aix-douche, Nauheim baths, brine-pine or Homburg baths, etc.

Hotels.—Royal Hotel (see p. 86); Worcestershire Brine Baths Hotel (see p. 85).

Boarding Establishment.—Ayrshire House (see p. 86).

(See also p. xlii.)

Harrogate (Yorkshire).—450–600 feet above sea level, 203 miles from London. Unequalled by any Continental spa. The climate is stimulating and fairly dry—bracing moorland air. Average rainfall 30 inches. Mean temperature 46° F.

Waters.—Celebrated for the medicinal properties of its 88 different mineral waters—sulphurous, chalybeate, alkaline, and saline.

Therapeutic indications.—Gout and other metabolic disorders, functional liver derangement and early cases of cirrhosis, cholelithiasis and cholecystitis, chronic skin diseases, neuritis and arthritis, mucous colitis, chronic dysentery, constipation, and intestinal toxæmias, anaemia, nervous diseases, hyperpiesis, and the sequelæ of tropical diseases.

Baths.—There are five establishments, where nearly 100 treatments are given, including all the Continental systems and others. The staff of 200 are all medically trained and certificated, as also are the masseurs. The waters are continually under scientific control by the highly qualified scientific officer on the permanent staff. Harrogate also possesses its own pathologist and bacteriologist, X-ray expert, etc.

The surrounding country is unsurpassed for beauty and interest, and the amusements and recreations are of the highest order.

Mineral Water.—‘Aquaperia’ aperient mineral water is bottled at Harrogate by Camwal Ltd. from their own Spring. (See p. 159.)

(See also p. xlii.)

Leamington Spa (Warwickshire).—195 feet above sea level; 88 miles from London. Equable and mild climate. Average rainfall 24 inches. Mean annual temperature 49°. Westerly winds prevail.

Waters.—Radio-active saline springs, resembling those of Homburg, but more generally useful.

Therapeutic indications.—Muscular and articular rheumatism, gout, rheumatoid arthritis, neuralgia and neuritis, diseases arising from a plethoric condition of the chylipoietic viscera, eczema and other irritative disorders of the skin, conditions of increased vascular tension, and chronic interstitial nephritis.

Baths.—Turkish, saline, Plombières, paraffin wax, Berthollet, and electric of all kinds. Swimming baths.

(See also p. xlii.)

Llandrindod Wells (Radnorshire).—Situated amidst beautiful mountain and river scenery in Mid-Wales at an altitude of 750 feet above sea-level. Climate exceedingly bracing, but sheltered from east winds, and with an average rainfall of about 40 inches. About 204 miles distant from London on the main L.M. & S. Railway, about mid-way between Shrewsbury and Swansea.

Waters.—Celebrated for the variety and efficacy of its numerous medicinal springs. Saline, sulphur and radium-sulphur, magnesium, lithia saline and chalybeate. Slightly aperient and strongly diuretic.

Therapeutic indications.—Digestive disorders, gout and rheumatism, rheumatoid arthritis, neuritis and fibrositis, gall-stones and biliary stasis, renal calculus or any kidney or bladder condition requiring diuresis, and in neurasthenia or debility from overwork.

Baths.—Sulphur, immersion, needle and douche; Aix and Vichy douche and massage; Scotch douche; Nauheim; medicated baths; fango and peat baths; whirlpool and agitation baths; almost every known form of electrical treatment by fully qualified staff.

Hotel.—Ye Wells Hotel (see p. 87).

(See also p. xlv.)

Strathpeffer Spa (Ross-shire. N.B.).—180 to 300 feet above sea level. Sheltered practically on all sides, except the N.E. Prevailing wind S.W. Bracing air. Average rainfall 31 inches. Mean annual temperature 45° F.

Waters.—Sulphurous and chalybeate. Sulphates the predominating salt. Have strong diuretic and mild aperient action.

Therapeutic indications.—Chronic gout and rheumatism, rheumatoid arthritis, chronic skin diseases, chronic disorders of the digestive system, chronic gastric or intestinal catarrh, sluggish portal circulation, congested liver, biliary and urinary calculi, and neurasthenia.

Baths.—Sulphurous (immersion), inhalation, peat, douche (Aix and Vichy), needle, pine, Russian. Nauheim, Plombières, radiant heat (electric), and high-frequency current.

(See also p. xlv.)

Woodhall Spa (Lincolnshire).—50 feet above sea level. 124 miles from London. Average rainfall 22½ inches. The air, bracing and uncontaminated, sweeping across the Lincolnshire wolds from the sea, is soothing and curative, bringing restful sleep to jaded nerves. The quiet simplicity of Woodhall Spa is in itself a distinction.

Waters.—Bromo-iodine waters, rich in the chlorides of sodium, calcium, and magnesium, with bromine and iodine.

Therapeutic indications.—Rheumatism (chronic articular and muscular), lumbago, arthritis deformans, gouty arthritis, sciatica, neuritis, paralysis, neurasthenia; injuries to joints; skin diseases, psoriasis, urticaria; diseases peculiar to women; diseases of throat and nose; liver disorders. Not only is Woodhall Spa the place to visit in cases of rheumatism, gout, or any of the diseases mentioned; but those who are suffering from overwork and nerve-strain will find it a delightful holiday resort.

Spa Baths.—These include immersion, shower, undercurrent and local douches; Aix and Vichy douche massage; Nauheim, electric and Schnee baths; Dowsing radiant heat and light baths; Bergonié treatment; nose, throat, and eye mineral sprays and douches; Russian and Berthollet vapour; electric, ionic, and X-ray treatments; paraffin-wax treatment; massage and Swedish exercises. There are 60 acres of grounds surrounding the Pump Room. Particulars, apply Secretary.

(See also p. xlv.)

New Zealand Spas.—The mineral waters of New Zealand are famed both for their great variety and for their powerful therapeutic properties. Many of them are almost unique: quite unlike any European waters; others are of kinds familiar in Europe, but stronger in mineralization than most Continental waters. The principal spas are:—

ROTORUA.—A first-class, well-equipped spa, with complete modern bathing establishment and limitless supply of sulphur waters of two main types: alkaline sulphur, containing sodium chloride, bicarbonate, and silicate; and acid sulphur, containing sulphuric acid, and used for baths only. There are mud baths supplied from the *boiling mud springs*, corresponding to the fango treatment of Italy, and natural vapour baths. The massage and electrical department is thoroughly up to date. The whole establishment is under Government management, and skilled medical attendance is provided.

Climate and Season.—The latitude corresponds to that of the south of Spain, but the spa being 1000 ft. up, the climate is by no means hot. Season from December to May, but baths open all the year round.

Accommodation.—Several hotels and numerous boarding houses.

Access by train from Auckland or Wellington.

TAUPO.—The most elevated spa in New Zealand.

Climate.—Tonic and sedative. The waters are hot salines, with carbonic acid gas; also alkaline and chalybeate.

TE AROHA.—Hot alkaline waters of the Vichy type, but double the strength. There are comfortable baths, but this is essentially a place for drinking the waters, which are unique in their strength of sodium bicarbonate.

Climate.—Mild and sedative.

Accommodation.—Several hotels and boarding houses.

Access by train, branch from Rotorua line.

HANMER.—In the South Island: has mild sulphur baths and a bracing climate.

(See also p. xlv.)

OTHER BRITISH SPAS.

Bridge of Allan (Stirlingshire).—422 miles from London. Sheltered from N. and N.E. winds by the Ochil Hills. Average rainfall 35 inches. Climate mild and equable.

Waters.—Natural saline mineral springs (Airthrey).

Therapeutic indications.—Chronic affections of the liver, stomach, and bowels, in many chest diseases, rheumatism, gout, sciatica, and in some diseases of the skin.

Baths.—Excellent suite of baths.

Church Stretton (Salop).—613 feet above sea level. 153 miles from London. Pure bracing air, and a generally invigorating climate. Prevailing wind, S.W. Average rainfall 33 inches. Mean temperature 44°.

Waters.—Said to be the purest in Great Britain.

Therapeutic indications.—Specially the 'open-air' cure of neurasthenia, for sequelæ of influenza, for insomnia, functional nervous diseases, chronic gout and rheumatism, chronic gastric and bronchial catarrh, debility from over-work, and convalescence after illness or operation.

Ilkley (Yorkshire).—Situated on the southern slope of the valley of the Wharfe. 211 miles from London, 18 miles from Harrogate. Occupying a sheltered position. Average rainfall 38 inches. Mean annual temperature 48° F. Bracing and invigorating moorland air.

Waters.—The water supply obtained from springs is remarkably pure, bright and sparkling. Chalybeate waters. Saline.

Therapeutic indications.—Gout, rheumatism, neuritis, neurasthenia, anæmia, asthma, and bronchitis cases are benefited. The treatment adopted is that known as hydrotherapeutic.

Baths.—Complete suites of baths are to be found in the numerous establishments Electrical, Weir-Mitchell.

Hydropathic Establishment.—Craiglands Hydropathic (*see p. 85*).

Llangammarch Wells (Breconshire).—600 feet above sea level. 213 miles from London. Well protected from the east, and prevailing wind is S.W.

Water.—Saline, containing the chlorides of barium ($6\frac{1}{2}$ grains per gallon), calcium, magnesium, lithium, and sodium: the only one of its kind in the British Isles.

Therapeutic indications.—Cardiac diseases, organic and inorganic, especially affections of the myocardium due to influenza. Graves' disease, chronic muscular and articular rheumatism, osteo-arthritis, gout, sciatica, and neurasthenia.

Malvern (Worcestershire).—520 feet above sea level. A health centre of long repute, 122 miles from London. Rapid train service from all parts by G.W.R. and L.M.S.R. Air dry and bracing. Prevailing winds S.W. and W. Average rainfall 28 inches. Mean temperature about 49° F. Exceptional sunshine records. Set amidst a ten-mile range of hills with unrivalled views.

Waters.—Mainly spring, of remarkable purity, free from organic matter, less than 4 grains of earthy salts per gallon, with high eliminative qualities. 'Malvernian' Alkaline Table Water is bottled by W. & J. Burrow Ltd. (*see p. 155*).

Therapeutic indications.—Gout, rheumatism, rheumatoid arthritis, neuralgia, sciatica, lumbago, dyspepsia, constipation, anæmia, bronchial, nephritic, and cutaneous diseases.

Baths and Treatments.—Natural brine, Turkish and electric baths. Vichy massage and Aix douches, and every Spa treatment under competent direction.

Matlock Bath (Derbyshire).—300 to 800 feet above sea level, 143 miles from London. Average rainfall 36 inches. Mean temperature about 47° F. Very sheltered.

Waters.—Thermal springs. Mild sulphated alkaline—saline waters at 68° F., containing 33 grains per gallon of salts, mainly magnesium and calcium bicarbonate, and magnesium sulphate.

Therapeutic indications.—Rheumatism, gout, rheumatoid arthritis, neuritis, neurasthenia, catarrhs (bronchial, gastric, or enteric), anæmia cardiac asthenia, chronic diseases of the liver or kidneys, digestive and biliary disorders.

Baths.—A complete modern installation exists for the administration of all kinds of baths, douches, packs, and other hydropathic treatment, electricity, massage, inhalations, Nauheim baths, with Swedish exercises.

Matlock Bank (Matlock station, one mile by rail from Matlock Bath).—South-westerly aspect, and well sheltered from the north. 144 miles from London. Climate mildly bracing. Sunshine above the average. The Matlock system of hydropathic treatment is carried out in all its branches, and the principal hydros are installed with latest electric

baths and appliances, including high-frequency, Dowsing radiant heat and light, Schnee four-cell, X rays, etc. They also include Turkish, Russian, plunge, medicated, and inhalation baths, Aix and Vichy douches.

Hydropathic Establishment.—Smedley's Hydropathic (*see p. 83*).

Peebles (Peeblesshire, N.B.).—About 500–600 ft. above sea level. One hour from Edinburgh and 382 miles from London. Rainfall, 27 inches. Bracing climate, but sheltered from the north winds.

Waters.—The chief ingredient is chloride of sodium. They are obtained from the famous St. Ronan's Well (6 miles east).

Therapeutic indications.—The waters are specially suited to the Nauheim and Bourbon Lancy treatment of cardiac disease, dyspepsia, gout, rheumatism, and neurasthenia.

Baths.—The baths at the hydropathic are of the most modern type. Complete electrical installation and mud baths (Fango-di-Battaglia).

Torquay (Devonshire).—199½ miles from London. Non-stop express trains run daily, the journey occupying only 3¼ hours. There are through carriages from Northern and Midland cities. The most beautifully situated marine health resort in the British Isles. Well sheltered from the north. The sunshine record is one of the highest in the country. During 1925 there were 1,822.02 hours of sunshine. A very notable feature is the large average of winter sunshine. During the winter months the mean temperature is 44.8°.

Climate.—Mild, soft and equable. It is specially beneficial for many pulmonary, bronchial and laryngeal conditions, for mild cases of nephritis, for delicate children, and for aged and debilitated persons. Those unable to withstand the rigour of the winter in other British health resorts derive great benefit from residence in Torquay. Average rainfall about 33 inches. The season is all the year round.

Baths.—The medical baths are very modern and complete. They are ideally situated. All British and Continental spa treatments are available. A trained and skilled staff is always in attendance. Medical consultation rooms have been opened for the convenience of medical practitioners and patients. There is a large tepid sea-water swimming bath. Salt-water baths, concentrated brine baths, seaweed baths, and Dartmoor peat packs are a speciality, and are indicated in the treatment of muscular rheumatism, fibrositis, sciatica, rheumatoid arthritis, osteo-arthritis and gout.

(*See also p. xli.*)

Trefriw Wells (Carnarvonshire).—5 hours from London. The climate is bracing, the air soft, pure, and mostly of a westerly or south-westerly type. The pump-room and baths are open all the year, but the principal season is March to the end of October.

Waters.—Two varieties: (1) The stronger sulpho-chalybeate, and (2) the milder sulpho-chalybeate. Used internally, and externally in the form of baths. The waters are also supplied for home treatment in hermetically sealed phials, a special feature of this Spa.

Therapeutic indications.—Curable forms of anæmia, nervous, debilitating and wasting diseases, rheumatism, sciatica, gout, and neuritis.

(*See also p. 82.*)

Tunbridge Wells (Kent).—400 feet above sea level, 34 miles from London. Climate is tonic and invigorating. Prevailing winds W. and S.W.

Waters.—A weak non-aerated, chalybeate spring, containing 4 grains ferrous carbonate to the gallon, with sulphates and chlorides of potash, soda, and calcium.

Therapeutic indications.—Waters indicated in anæmia, chlorosis, and allied conditions.

Baths.—Immersion, douche, needle, Turkish, Russian, vapour, swimming, medicated, and electric light.

Hotel.—The Spa Hotel (*see p. 80*).

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- Manchester Obstetric Journal—Yearly, 2/6—8, St. Peter's Square, Manchester.
- Massage and Medical Gymnastics, Journal of the Chartered Society of—Monthly 6d.—157, Great Portland Street, W.1.
- Masseuses and Masseurs, Register of—Yearly 4/-—157, Great Portland Street, W.1.
- Maternity and Child Welfare—Monthly 1/-; 10/6 per annum—Bale, 83-91, Great Titchfield Street, W.1.
- Medical Annual—Yearly 20/- net; Subscribers before publication 17/- net, post free—John Wright & Sons Lim., Bristol.
- Medical Directory—Yearly 30/- net—Churchill, 40, Gloucester Place, W.1.
- Medical Officer—Weekly 1/-; 42/- per annum (and Supplement monthly: The Jennerian)—36-38, Whitefriars Street, E.C.4. (*See Advertisement.*)
- Medical Press and Circular—Weekly 6d.; 21/- per annum—8, Henrietta Street, W.C.2. (*See Advertisement.*)
- Medical Register—Yearly 21/-—Constable, 10, Orange Street, W.C.2.
- Medical Review—Monthly 2/6; 30/- per annum—70, Finsbury Pavement, E.C.2.
- Medical Times—Monthly 6d.—8 & 9, St. Alban's Place, Islington, N.1.
- Medical Women's International Journal—Twice yearly—24, Old Jewry, E.C.2.
- Medical World—Weekly 1/-; 52/- per annum—56, Russell Square, W.C.1.
- Medical and Dental Students' Register—Yearly 7/6—10, Orange Street, W.C.2.
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- National Medical Journal—Quarterly 6d.—National Medical Union, 11, Chandos Street, W.1.
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- Physiology, Journal of—Quarterly, 30/- per volume—Fetter Lane, E.C.4.
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1928	
JANUARY.	
S	1 815 22 29
M	2 918 23 30
Tu	3 1017 24 31
W	4 1118 25 *
Th	5 1219 26 *
F	6 1320 27 *
S	7 1421 28 *

NOTES.

Copy here any formula or fact you wish
to keep for reference.

1928	
FEBRUARY.	
S	* 51219 28
M	* 61320 27
Tu	* 71421 28
W	1 81522 29
Th	2 91623 *
F	3 101724 *
S	4 111825 *

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S	* 411 14 25
M	* 512 19 26
Tu	* 618 20 27
W	* 714 21 28
Th	1 815 22 29
F	2 916 23 30
S	3 1017 24 31

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1928

APRIL.	
S	1 815 22 29
M	2 916 23 30
Tu	3 1017 24 *
W	4 11 18 25 *
Th	5 12 19 26 *
F	6 18 20 27 *
S	7 14 21 28 *

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M	* 714 21 28
Tu	1 815 22 29
W	2 916 23 30
Th	310 17 24 31
F	411 18 25 *
S	512 19 26 *

NOTES.

1928

JUNE.	
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M	* 411 18 25 *
Tu	* 512 19 26 *
W	613 20 27 *
Th	* 714 21 28 *
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1928

JULY.	
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Mo	2 9 16 23 30
Tu	3 10 17 24 31
W	4 11 18 25 *
Th	5 12 19 26 *
Fr	6 13 20 27 *
S	7 14 21 28 *

NOTES.

1928

AUGUST.	
Su	* 5 12 19 26
Mo	* 6 13 20 27
Tu	* 7 14 21 28
W	1 8 15 22 29
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Fr	3 10 17 24 31
S	4 11 18 25 *

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Sl	* 810 17 24 *
Tu	* 411 18 25 *
W	* 512 19 26 *
Th	* 618 20 27 *
F	* 714 21 28 *
S	11 815 22 29

ADDRESSES (PRIVATE).

1928

OCTOBER	
Sa	* 714 21 28
Sl	1 815 22 29
Tu	2 916 23 30
W	3 1017 24 31
Th	411 18 25 *
F	512 19 26 *
S	613 20 27 *

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Tu	* 613 20 27
W	* 714 31 28
Th	1 815 22 29
F	2 916 23 30
S	3 1017 24 *

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1928

DECEMBER	
S	* 2 916 28 30
M	* 3 1017 24 31
Tu	* 4 11 18 26 *
W	* 5 12 19 28 *
Th	* 6 13 20 27 *
F	* 7 14 21 28 *
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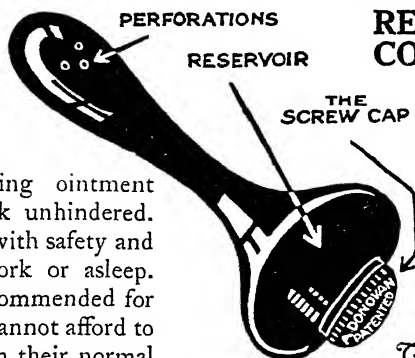
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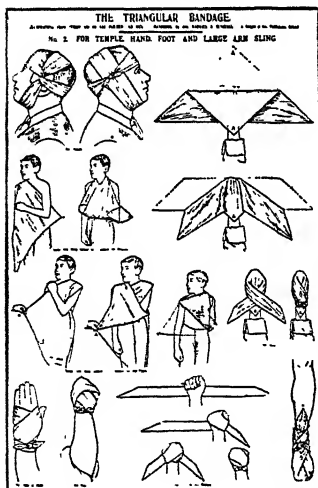
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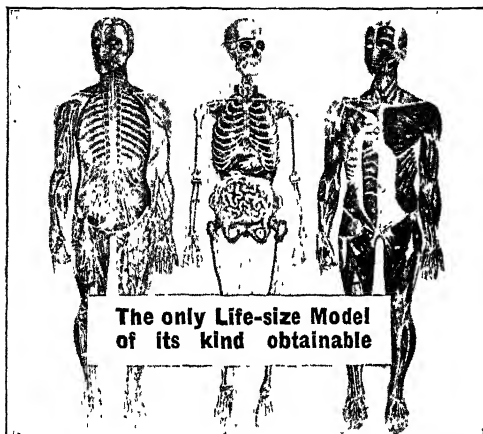
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Physician to H.M. Household; Physician and Lecturer, Guy's Hospital, etc.

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Atlas Assurance Co. Ltd., 92, Cheapside, E.C.2. <i>Gen. Man.</i> , C. H. Falloon. <i>Act. and Life Man.</i> , William Penman P	1808	48/1	63/7	88/4	3,328,816
Australian Mutual Provident Society, Life, Endowments and Annuities, 73-76, King William St., E.C.4. <i>Man. for U.K.</i> , Robert Thodey, F.I.A. <i>Further particulars see opposite page</i> M	1849	48/2	64/5	89/10	*55,812,779
Britannic Assurance Co. Ltd., Life, Fire, Accident, and General Insurances, Broad St. Corner, Birmingham. <i>Chairman</i> , Jno. A. Jefferson. <i>Sec.</i> , J. M. Laing, F.I.A. <i>Further particulars see opposite page</i> P	1866	47/9	64/-	91/1	15,000,000
British Equitable Assurance Co. Ltd., 1, 2, 8, Queen Street Place, E.C. <i>Man.</i> , Douglas A. Coleman P	1854	48/8	64/11	91/9	1,595,834
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Canada Life Assurance Co., 2, St. James's Square, S.W.1. <i>Man.</i> , J. R. Wandless, F.I.A. P	1847	48/5	65/4	94/2	25,105,163
Clerical, Medical, and General Life Assurance Society, 15, St. James's Square, S.W.1, and 8, King William St., E.C.4. <i>Gen. Man. and Act.</i> , A. D. Besant P	1824	47/6	65/2	94/10	8,817,338
Colonial Mutual Life Assurance Society Ltd., 4, St. Paul's Churchyard, E.C.4. <i>Man.</i> , Ernest A. Cawdron. <i>Sec.</i> , J. S. Gillespie M	1873	48/9	65/1	89/10	7,716,116
Commercial Union Assurance Co. Ltd., Adelaide House, King William Street, E.C.4 (Temp. while rebuilding). <i>Act.</i> , A. G. Allen P	1861	47/10	65/2	92/4	14,427,089
Confederation Life Association (of Canada), Bush House, Aldwych, W.C.2. <i>Man.</i> , G. T. Varney P	1871	48/6	65/2	94/2	10,389,217
Co-operative Insurance Society Ltd., 109, Corporation Street, Manchester. <i>Man.</i> , J. P. Jones M	1867	47/4	63/1	90/1	3,202,097
Eagle Star & British Dominions Insurance Co. Ltd., 1, Threadneedle St., E.C.2; Life Dept., 32, Moor-gate, E.C.2. <i>Man. Dir.</i> , Sir Edward M. Mountain, Bart., J.P. P	1807	48/1	63/10	89/5	15,177,139
Equitable Life Assurance Society, 19, Coleman Street, E.C.2. <i>Act. and Man.</i> , W. Palin Elderton, F.I.A. M	1762	54/-	68/-	92/-	6,134,975
Equity & Law Life Assurance Society, 18, Lincoln's Inn Fields, W.C. <i>Man. and Sec.</i> , W. P. Phelps, M.A., F.I.A. P	1844	48/10	64/6	90/9	6,989,779

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Gresham Life Assurance Society Ltd., 188-190, Fleet St., E.C.4. <i>Gen. Man. and Sec.</i> , Alex. Lawson P	1848	47/6	62/10	88/6	6,726,514
Guardian Assurance Co. Ltd., 68, King William St., and 21, Fleet St., E.C. <i>Gen. Man.</i> , Geo. W. Reynolds. <i>Sec.</i> , A. G. Sweet, <i>Act.</i> , W. P. Cook P	1821	48/10	64/6	89/3	5,870,403
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†Legal & General Assurance Society Ltd., 10, Fleet St., E.C. <i>Gen. Man.</i> , W. A. Workman, F.I.A. P	1886	—	—		18,100,660
Life Association of Scotland, 82, Princes St., Edinburgh. <i>Man. and Act.</i> , R. M. M. Roddick. <i>Sec.</i> , Alex. Prentice. London. 28, Bishopsgate, E.C. <i>Sec.</i> , G. S. N. Carter . . . P	1838	48/11	64/10	91/1	6,497,554
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London Life Association Ltd., 81, King William St., E.C.4. <i>Act. and Man.</i> , H. M. Troncker, M.A., F.I.A. . . . M	1806	47/-	61/8	85/4	15,564,255
Marine and General Mutual Life Assurance Society, 48, Fenchurch Street, E.C.3. <i>Act. and Sec.</i> , Howard T. Cross, F.I.A. . . . M	1852	48/10	65/-	91/6	2,970,804
Medical Sickness Annuity & Life Assurance Society, Ltd., 300, High Holborn, W.C. <i>Man. and Sec.</i> , Bertram Sutton, F.C.I.I. . . . M	1884	40/2	55/3	80/-	161,137
Metropolitan Life Assurance Society, 13, Moorgate, E.C.2. <i>Act. and Man.</i> , H. J. Baker, F.I.A. M	1835	49/9	66/4	92/-	2,616,226
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National Provident Institution, 48, Gracechurch St., E.C.3. <i>Act. and Sec.</i> , L. F. Hovill, F.I.A. . . M	1835	50/2	66/3	91/1	9,925,342
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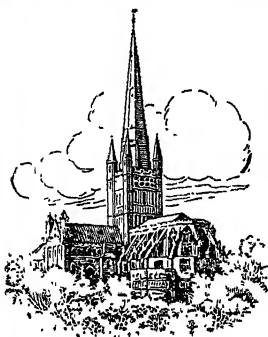
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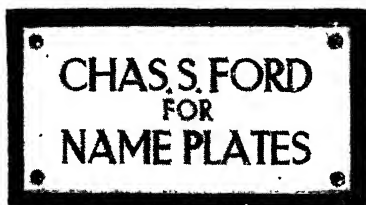
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For further particulars apply THE DEAN.

UNIVERSITY OF BRISTOL.

FACULTY OF MEDICINE.

THE University affords complete courses of instruction for its own examinations, those of the University of London, and those of the Conjoint Board, etc., for Medical Degrees or Diplomas. The Dental Department affords the necessary instruction for the Degrees and Diploma of the University and of other examining bodies in that subject.

The University confers the following Degrees and Diplomas :

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY	M.B., Ch.B.
MASTER OF SURGERY	Ch.M.
DOCTOR OF MEDICINE	M.D.
DOCTOR OF PHILOSOPHY	Ph.D.
BACHELOR OF DENTAL SURGERY	B.D.S.
MASTER OF DENTAL SURGERY	M.D.S.
DIPLOMA IN DENTAL SURGERY	L.D.S.
DIPLOMA IN PUBLIC HEALTH	D.P.H.

The early part of the curriculum so interlocks with the curriculum for the B.Sc. that the Medical student may without much loss of time take also the degree of B.Sc. Moreover, the Dental student may in seven years take both Dental and Medical degrees. The whole of the Dental Mechanical work for the Bristol Royal Infirmary and the Bristol General Hospital is done in the University laboratory by the students, instructed by skilled mechanics.

CLINICAL WORK is done at the Bristol Royal Infirmary and the Bristol General Hospital, which together contain 628 beds. The Bristol Royal Hospital for Sick Children and Women (100 beds), the Bristol Eye Hospital, the Bristol City and County Asylum, and the Bristol City Fever Hospital are also open for the clinical instruction of students

SCHOLARSHIPS.—There is no entrance scholarship, but students from the City of Bristol may, on their merits, receive financial aid from the City Scholarship Fund on application to the Director of Education, Guildhall, Bristol. Forms of application must be returned to him by April 30th.

Several Scholarships and Prizes are open to students during their Hospital career.

HOSPITAL APPOINTMENTS open to students after qualification.

At the Bristol Royal Infirmary.—Two House Surgeons, two House Physicians (of these one is chosen as Senior Resident Officer), one Resident Obstetric Officer, one Throat, Nose and Ear House Surgeon, one Ophthalmic House Surgeon, one Casualty Officer, and one Dental House Surgeon.

At the Bristol General Hospital.—One Senior House Surgeon, one Casualty House Surgeon, two House Physicians, one House Surgeon, and one Dental House Surgeon. All these appointments are salaried, with board and residence.

For further particulars and prospectus apply to the DEAN of the Faculty of Medicine.

UNIVERSITY OF DURHAM

COLLEGE OF MEDICINE,

NEWCASTLE - UPON - TYNE.

DEGREES IN MEDICINE, SURGERY, HYGIENE, AND DENTISTRY, DIPLOMAS IN PUBLIC HEALTH AND PSYCHIATRY AND LICENCE IN DENTAL SURGERY are conferred by the University of Durham—viz., the Degrees of Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, Master of Surgery, Doctor of Surgery, Bachelor of Hygiene, Doctor of Hygiene, Bachelor of Dental Surgery, Master of Dental Surgery, Diploma in Public Health, Diploma in Psychiatry, and Licence in Dental Surgery. These Degrees, Diplomas and Licence are open to men and women.

Attendance at the University of Durham College of Medicine during one of the five years of professional study, or subsequently to qualification elsewhere, is required as part of the curriculum for the Degrees except in the case of Practitioners of more than fifteen years' standing, who having attained the age of forty years can obtain the Degree of M.D. after examination only.

Students can complete at the University of Durham College of Medicine, Newcastle-upon-Tyne, the entire course of professional study required for the above degrees and for the Diplomas in Public Health and Psychiatry; also for the examinations of the Royal Colleges of Physicians and Surgeons.

A Dental Curriculum is provided, and Degrees and a Licence in Dental Surgery may be obtained after examination.

The Royal Victoria Infirmary contains 550 beds. Clinical Lectures are delivered by the Physicians and Surgeons in rotation. Pathological Demonstrations are given by the Pathologist. Practical Midwifery can be studied at the Princess Mary Maternity Hospital, which contains 80 beds, with an annual indoor and outdoor attendance on 3000 cases.

Post-Graduate Courses (general and special) are held under the joint auspices of the College and the Royal Victoria Infirmary.

Particulars regarding scholarships, fees, etc., may be obtained from the REGISTRAR, at the College.

UNIVERSITY OF MANCHESTER

FACULTY OF MEDICINE.

The WINTER SESSION commenced on October 6th.
The Laboratories and Museums afford every facility to Students and Graduates for Practical Instruction as well as for Original Research.

SCOPE OF INSTRUCTION.

Complete Courses of Instruction are offered for the Examinations of the University of Manchester, and also for the Examinations of other Examining Bodies in the United Kingdom. In the Dental Department Complete Courses are given preparing for the Degrees and Diploma in Dentistry granted by the University, as well as for the Diploma of the Royal College of Surgeons of England, and other Dental Diplomas. The Public Health Laboratories are situated at a short distance from the University. The fullest opportunities are offered to Graduates and others in preparation for the Diplomas in Public Health, Bacteriology, Psychological Medicine and Veterinary State Medicine, and for Special Certificates in School Hygiene and Factory Hygiene. Post-graduate Courses are to be held in various Branches of Medicine and Surgery, information of which can be obtained from the Dean of the Medical School.

OPPORTUNITIES FOR CLINICAL STUDY—ROYAL INFIRMARY & OTHER HOSPITALS.

The Clinical Instruction is given in the new Royal Infirmary, opened in 1909 on a site near to the Medical School. It is provided with every modern requirement for the treatment of the sick and the investigation of disease. Instruction in Special Subjects is given in other Hospitals associated with the University. A large number of beds in the General and in the Special Hospitals are available, thus affording unrivalled opportunities for Clinical Study.

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| 1. The Manchester Royal Infirmary .. 668 Beds | 6. Fever Hospital for Infectious Diseasesabout 600 Beds |
| 2. The St. Mary's Hospitals for Women and Children .. .. .about 241 Beds | 7. Special Hospitals for Diseases of the Ear, Throat and Chest, Skin, and the Christie Cancer Hospital about 222 Beds |
| 3. Manchester Children's Hospital .. 190 Beds | 8. Dental Hospital of Manchester |
| 4. Manchester Royal Eye Hospital .. 126 Beds | 9. Ancoats Hospital .. .. .120 Beds |
| 5. Manchester Northern Hospital for Women and Children 70 Beds | 10. Salford Royal Hospital 200 Beds |

Hospital Appointments.—In consequence of the large number of Hospitals associated with, or in the vicinity of, the University, exceptional opportunities are offered to Graduates to obtain Resident Hospital Appointments.

Scholarships, Exhibitions and Prizes.—Two Open Entrance Scholarships, each of the value of not more than 100 guineas are offered yearly in July. In addition, the Dreschfeld Scholarship of £20 per annum, the John Russell Medical Entrance Scholarship, £45 per annum, and other Entrance Scholarships of the value of £10 to £40 a year for two or three years, are also tenable in the Medical Faculty.

Fellowships, Scholarships, &c. are also offered for Competition to Students of the Faculty.

Residence for Undergraduates.—There are Halls of Residence both for Men and for Women Students. Lodgings can also be recommended. Full information can be obtained from the Dean of the Medical School.

University of St. Andrews

(SCOTLAND).

Chancellor—Field-Marshal The Right Hon. EARL HAIG OF BEMERSYDE, K.T., G.C.B., O.M., G.C.V.O., K.C.I.E., LL.D.

Rector—FRIDTJOF NANSEN, G.C.V.O., D.Sc., D.C.L., Ph.D., LL.D., F.R.G.S.

Vice-Chancellor and Principal—Sir JAMES COLQUHOUN IRVINE, C.B.E., D.Sc., LL.D., Sc.D., F.R.S.

FACULTY OF MEDICINE

(Dean—F. J. CHARTERIS, M.D.)

The University confers the following DEGREES AND DIPLOMAS—M.B., Ch.B., M.D., Ch.M., Ph.D., D.P.H., LL.D.S. (all open to men or women).

SESSION 1928-1929 opens 4th October, 1928. The whole curriculum may be taken at Dundee, or the first two years may be taken in St. Andrews, the remaining three in Dundee.

CLINICAL INSTRUCTION at Dundee Royal Infirmary, and other Medical and Surgical Institutions in Dundee.

BURSARY (Scholarship) Competitions June annually. Entries due 8th May.

HARKNESS RESIDENTIAL ENTRANCE SCHOLARSHIPS FOR MEN, Five of £100 competed for annually in June. Medical Students are eligible.

FEES for complete M.B., Ch.B. Course, exclusive of Examination Fees, Hospital Fees, etc., £182.

PRELIMINARY EXAMINATION. September and March. Entries due 15th August and 13th February.

PRE-REGISTRATION EXAMINATION. (Physics and Chemistry) September, December, and June. Entries due 31st August, 7th November, 8th May.

RESIDENCE HALLS for Men and Women at St. Andrews; for Women at Dundee.

Provision made for **POST-GRADUATE STUDY AND RESEARCH.**

Full information may be obtained from the **SECRETARY OF THE UNIVERSITY**, 71 North Street, St. Andrews; or the **DEAN OF THE FACULTY OF MEDICINE**, Westlands, St. Andrews.

UNIVERSITY OF EDINBURGH

Principal—Sir J. ALFRED EWING, K.C.B., M.A., D.Sc., LL.D., F.R.S.

The SUMMER SESSION, 1928, opens on 17th April, and closes on 29th June.

The WINTER SESSION, 1927-28, opens on 4th October (3rd, 4th and 5th years), 11th October, (1st and 2nd years), and closes on 16th March.

FACULTY OF MEDICINE.

Dean—Professor J. LORRAIN SMITH, M.A., M.D., LL.D., F.R.S.

The Faculty embraces 19 Professors and 80 Lecturers, and attached to these there are about 40 Assistants and Demonstrators. Instruction is given in all the main branches of Medical Science, viz. —

PROFESSORS:

Chemistry—George Barger, D.Sc., F.R.S.
Zoology—J. Cossar Ewart, M.D., F.R.S.; J. H. Ashworth, D.Sc., F.R.S.
Botany—Wm. Wright Smith, M.A., F.R.S.
Anatomy—Arthur Robinson, M.D. [F.R.S.
Physiology—Sir E. Sharpey-Schafer, LL.D.
Materia Medica—Alfred J. Clark, M.C., M.D., F.R.C.P. [F.R.S.
Pathology—J. Lorrain Smith, M.D., LL.D.
Bacteriology—Thomas Jones Mackie, M.D.
Public Health—Percy Samuel Lelean, C.B., C.M.G., F.R.C.S.

UNIVERSITY

Clinical Surgery—A. A. Scott Skirving, C.M.G., M.B., C.M.; Geo. L. Chene, M.B., C.M.; W. J. Stuart, M.B., Ch.B.; J. W. Struthers, M.B.; Henry Wade, M.D.
Clinical Medicine—R. A. Fleming, M.D.; I. Chalmers Watson, M.D.; Edwin Mathew, M.D.; W. T. Ritchie, M.D.; J. Eason, M.D.
Clinical Gynaecology—R. W. Johnstone, M.D.; J. Haig Ferguson, M.D.; William Fordyce, M.D.; H. S. Davidson, M.B.; James Young, M.D.; W. F. T. Haultain, M.B.
Clinical Midwifery—R. W. Johnstone, M.D.; J. Haig Ferguson, M.D.; Wm. Fordyce, M.D.; James Young, M.D.; H. S. Davidson, M.B.; Douglas Miller, M.D.; W. F. T. Haultain, M.B.; E. C. Fahmy, M.B.
Diseases of the Eye—J. V. Feteisson, M.B., C.M.; A. H. H. Sinclair, M.D.; H. M. Tiquair, M.D.; E. H. Cameron, M.B.
Clinical Instruction in Diseases of Children—Chas. McNeill, M.D.; N. S. Carmichael, M.B., Ch.B.; L. H. F. Thatcher, M.D.; Gertrude Herzfeld, M.B.; Norman Dott, M.B.
Anatomy—E. B. Jamieson, M.D.
Applied Anatomy—F. E. Jaidine, M.B.
Histology—May L. Walker, M.A., B.Sc., M.B.
Physiological Chemistry—W. W. Taylor, D.Sc.
Experimental Physiology—Eric Ponder, M.D., D.Sc.
Physiology of the Nervous System—A. Nimn Bruce, M.D., D.Sc.
Experimental Pharmacology—(Vacant).

Forensic Medicine—H. Littlejohn, M.B., B.Sc.
Medicine—Geo. Lovell Gulland, C.M.G., M.D.
Surgery—D. P. D. Wilkie, M.D., Ch.M.
Midwifery and Gynaecology—R. W. Johnstone, M.A., M.D.
Clinical Surgery—John Fraser, Ch.M., M.D.
Clinical Medicine—Edwin Bramwell, M.D.; Geo. Lovell Gulland, C.M.G., M.D.; D. Murray Lyon, M.D.
Tuberculosis—Sir Robert W. Philip, M.D.
Therapeutics—David Murray Lyon, M.D.
Psychiatry—George M. Robertson, M.D.

LECTURERS:

Medicine—A. C. White, M.B., Ph.D.
Pathology—R. D. Mackenzie, M.B.; Theodore Retlie, D.Sc.
Morbid Anatomy—J. Davidson, M.B.
Bacteriology—D. G. S. McLachlan, M.B.
Physics—G. A. Carse, M.A., D.Sc.
Chemistry—Edgar Steadman, B.Sc., Ph.D.
Diseases of the Larynx, Ear and Nose—John S. Fraser, M.R.; J. D. Lithgow, M.B.; W. T. Gardiner, M.B.; G. Ewart Martin, M.R.
Tropical Diseases—Lt.-Col. E. D. W. Greig, C.I.E., M.D.
Medical Entomology and Parasitology—J. H. Ashworth, D.Sc., F.R.S.
Tropical Hygiene—J. B. Young, M.B., D.Sc. (conjointly with Professor).
Sanitary Administration—Wm. Robertson, M.D.
Diseases of the Skin—Frederick Gardiner, M.D.; R. Cranston Low, M.D.; Robert Atken, M.D.
Clinical Instruction in Infectious Fevers—W. T. Benson, M.D.; Alexander James, M.D. [M.D.
History of Medicine—J. D. Comie, M.A., B.Sc.
Surgical Pathology—(Vacant).
Veneral Diseases—David Lees, D.S.O., M.B.
Psychology—J. Dreyer, M.A., B.Sc., D.Phil.
Radiology—J. M. Woodburn Morison, M.D., D.I.R.E.
Neuro-Pathology—F. E. Reynolds, M.B.
Psychiatry—Wm. McAlister, M.B.
Clinical Experimental Methods—(Vacant).

Practical Instruction is afforded, under the superintendence of the Professors, in Laboratories with the necessary appliances, and in Tutorial and Practical Classes connected with the above Chairs, and opportunities are afforded to Students to extend their practical knowledge and engage in original research. Opportunities for Hospital Practice are afforded at the Royal Infirmary, the Hospital for Sick Children, Maternity Hospital, the City Fever Hospital, and the Royal Mental Hospital. Upwards of 3760 beds are available for the Clinical Instruction of Students of the University. Four Degrees in Medicine and Surgery are conferred by the Univ. of Edinburgh, viz.: Bachelor of Med. (M.B.), Doctor of Surg. (Ch.B.), Doctor of Med. (M.D.), and Master of Surg. (Ch.M.). The minimum Class Fees for M.B. and Ch.B., including Hospital Fee (£12), amount to about £210, and the Matric. and Exam. Fees to £45 3s. An additional Fee of £21 is payable by those who proceed to M.D., and £21 by those who proceed to Ch.M. The annual value of the Bursaries, Prizes, Scholarships, and Fellowships in the Faculty of Med. amounts to about £3,600, and that of the other Bursaries, etc., tenable by Students of Med., amounts to about £1,820.

POST-GRADUATE INSTRUCTION.—Courses of instruction are given for the University Diplomas in Public Health, Tropical Medicine and Hygiene, Psychiatry, and Radiology. These Diplomas are open to approved registered practitioners as well as to graduates in Medicine and Surgery of the University.

The University also takes part in the Courses given under the auspices of the Edinburgh Post-Graduate Courses in Medicine. In the departments of the Faculty of Medicine, provision is made for research by students of graduate standing.

In the University Laboratories facilities will be provided for candidates for the Degree of Ph.D. whose applications to engage in research have been accepted by the Senatus.

A Syllabus and further information as to Matriculation, the Curricula of Study for Degrees, etc., may be obtained from the Dean of the Faculty of Medicine; and for Degrees in the Faculties of Arts, Science, Divinity, Law, and Music, from the Deans of these Faculties, or from the Secretary; and full details are given in the University Calendar, published by James Thain, 55, South Bridge, Edinburgh. Price by post, 6s.

By Authority of the Senatus,
 W. A. FLEMING, Secretary.

ROTUNDA HOSPITAL DUBLIN.

UPWARDS of 2,000 maternity cases and 1,000 gynaecological intern patients are treated in the Hospital during the year. Besides the Hospital there is an extern Maternity Department with over 2,000 cases. The routine for Students consists of attendance at the Morning Lectures on Midwifery and Gynaecology, examination of patients in the Gynaecological Department, attendance at operations and all abnormal labour in the Hospital Wards, and conduction of labour cases in the intern and extern departments.

In addition there is a large antenatal clinic and an Infants' department where students are encouraged to attend. The Pathological Laboratory is open to the Class, and the X-Ray plant adds greatly to the Hospital.

Qualified Students are given facilities for following and observing all abnormal cases in the hospital or district, and are allowed, so far as possible, to assist at gynaecological operations.

The Hospital Courses are always going on during the year, and Students can join at any time. The class is limited, therefore it is advisable to register in advance. Board and lodging can be obtained in the Hospital, where the living quarters are extremely comfortable.

Extra classes in gynaecological diagnosis and operative midwifery are conducted by the Assistants to the Master.

FEES: One month, £6 6s.; months other than the first, £4 4s. Three months, £12 12s. I.M. Course, £21.

The L.M. Certificate is given to fully qualified Practitioners of Medicine on examination after six months' attendance at the Hospital.

FULL PARTICULARS FROM—

BETHEL SOLOMONS, M.D., F.R.C.P.I., MASTER, ROTUNDA HOSPITAL.

SCHOOL OF MEDICINE

OF

The Royal Colleges, EDINBURGH.

(FOUNDED 1505.)

SUMMER SESSION, 1928, opens 17th APRIL.

WINTER SESSION, 1928-9, opens 9th OCTOBER.

THE Lectures qualify for the English and Scottish Universities and other Medical Examining Boards.

One half of the Qualifying Classes required for graduation in the University of Edinburgh may be attended in this School.

The School offers a large choice of Teachers upon the various subjects comprised in the Medical Curriculum.

The Calendar of the School, giving all necessary information regarding Classes, Fees, and Examinations, will be published on September 15th; a copy may be obtained (price 6d., postage 2½d.) on application to the—

DEAN OF THE SCHOOL, SURGEONS' HALL, EDINBURGH.

THE UNIVERSITY OF LIVERPOOL

FACULTY OF MEDICINE.

The University grants degrees in Medicine, Surgery, Hygiene, Orthopædic Surgery, Dental Surgery, and Veterinary Science, also degree of Doctor of Philosophy, and Diplomas in Public Health, Tropical Medicine, Tropical Hygiene, Veterinary Hygiene, Medical Radiology and Electrology, and a Licence in Dental Surgery. Students may also prepare in the University for the examinations of other licensing bodies.

Medical School Buildings.—The buildings of the Medical School are all modern, and contain spacious lecture rooms, and well-equipped laboratories and class-rooms for the study of all the more important subjects which form the basis of medicine. In addition, laboratories are provided for medical research in Bio-chemistry, Tropical Medicine, Physiology, Pathology, Bacteriology, and Hygiene.

Hospitals.—The Clinical School consists of four general hospitals—the Royal Infirmary, the David Lewis Northern Hospital, the Royal Southern Hospital, and the Stanley Hospital; and of six special hospitals; the Eye and Ear Infirmary, the Hospital for Women (including the Samaritan Hospital), the Royal Liverpool Children's Hospital, St. Paul's Eye Hospital, St. George's Hospital for Skin Diseases, and Liverpool Maternity Hospital. These hospitals contain in all a total of over 1500 beds.

Fellowships and Scholarships.—Fellowships, Scholarships, and prizes of over £1000 are awarded annually. There are also numerous Entrance Scholarships. Particulars may be obtained on application.

The following Prospectuses may be obtained on application to the Registrar:—Medical Faculty, School of Tropical Medicine, School of Dental Surgery, School of Veterinary Science, and Diploma in Public Health.

WALTER J. DILLING, M.B., Ch.B.

UNIVERSITY of ABERDEEN

Founded 1494.

FACULTY OF MEDICINE.

THE Degrees in medicine granted by the University are—Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, and Master of Surgery. The Degree of Ph.D. is also granted in this Faculty. They are conferred after Examination, and only on Students of the University. Women are admitted to instruction and graduation on the same footing as men. A Diploma in Public Health is conferred (after Examination) on Graduates in Medicine of the University of Aberdeen, or of any University whose medical degrees are recognized as qualifying for registration by the General Medical Council of the United Kingdom. The Faculty of Medicine embraces thirteen chairs, and instruction is given in all departments of Medical Science.

Practical Classes are conducted by the Professors, Lecturers, and Assistants in Laboratories furnished with all necessary appliances; and facilities are afforded to Students and Graduates to extend their practical knowledge and to engage in original research.

Instruction is also given in special departments of Medical Practice by Lecturers appointed by the University Court.

Clinical instruction is obtained in the Royal Infirmary, the Royal Hospital for Sick Children, the City (Fever) Hospital, the General Dispensary, Maternity Hospital, Vaccine Institutions, Ophthalmic Institutions, and the Royal Mental Hospital.

Bursaries, Scholarships, Fellowships and Prizes, to the number of 50 and of the Annual Value of £1200, may be held by Students in this Faculty.

The cost of Matriculation, Class and Hospital Fees for the whole curriculum, inclusive of the fees for the Degrees, is approximately £236.

A Prospectus of the Classes, Fees, &c., may be had on application to the Secretary, and full particulars will be found in the University Calendar published by the Aberdeen University Press Ltd.

H. J. BUTCHART, Secretary.

Royal College of Surgeons of Edinburgh

(INCORPORATED 1505.)

Copies of the Regulations for the Fellowship, Licence, Higher Dental Diploma, and Licence in Dental Surgery, with dates of Examinations, may be had on application to—

MR. D. L. EADIE, 49 LAURISTON PLACE, EDINBURGH, *Clerk of the College.*

Medical and Dental Students must state date of Registration.

UNIVERSITY OF LONDON OPHTHALMIC HOSPITAL MEDICAL SCHOOL

ROYAL LONDON OPHTHALMIC HOSPITAL

(Moorfields Eye Hospital), CITY ROAD, E.C.1.

Qualified Medical Practitioners and Registered Medical Students may enter on the practice of the Royal London Ophthalmic Hospital (Moorfields) at any time, and are on certain conditions eligible for appointment as Chief Clinical Assistant, Clinical Assistant, and Junior Assistant.

Courses of Instruction, extending over a period of five months, begin in OCTOBER and MARCH:

1. PRACTICAL REFRACTION CLASSES.
2. METHODS OF EXAMINATION AND USE OF THE OPHTHALMOSCOPE.
3. LECTURES every afternoon on the following subjects:—(a) ANATOMY; (b) PHYSIOLOGY, (c) OPTICS; (d) PATHOLOGY; (e) OPHTHALMIC MEDICINE AND SURGERY, consisting of: MEDICAL OPHTHALMOLOGY, EXTERNAL DISEASES OF THE EYE, MOTOR ANOMALIES AND SQUINT, DISEASES OF THE RETINA AND OPTIC NERVE, DISEASES OF THE UVEAL TRACT.
4. OPHTHALMOSCOPIC CONDITIONS: A Practical Class with Demonstrations each week at 5 P.M.
5. CLINICAL LECTURES.
6. OCCASIONAL LECTURES on subjects allied to Ophthalmology.
7. OPERATIVE SURGERY. In these classes the usual operations are performed by the student upon pigs' eyes.
8. PRACTICAL PATHOLOGY. A Course of Demonstrations on the Normal and Morbid Histology of the Eye is given by the Pathologist in the Laboratory.
9. PRACTICAL BACTERIOLOGY.
10. CLASSES IN RADIOGRAPHY.
11. ULTRA-VIOLET LIGHT THERAPY.
12. SLIT-LAMP MICROSCOPY.

FEES.—A composition fee of 24 Guineas will entitle the Student to a perpetual ticket for the practice of the Hospital, including attendance for one Session on the above Courses (except Practical Pathology, Bacteriology, Ultra-Violet Therapy, and Slit Lamp Microscopy).

DIPLOMA IN OPHTHALMIC MEDICINE & SURGERY & OTHER DEGREES IN OPHTHALMOLOGY.

An Additional Special Course in the Preliminary Subjects (viz.:—Anatomy, Physiology, and Optics) for the D.O.M.S. and other Examinations in Ophthalmology, will be held twice a year, beginning in November and April. The fee for this Course is 12 guineas, or 5 guineas for each subject.

FEES FOR THE PRACTICE OF THE HOSPITAL:

Perpetual - £55 0; Three to Six Months - £33 0; Two Months - £22 0; One Month - £11 0
Clinical work begins at 9 a.m. daily. Operations are performed between 10 a.m. and 1 p.m.
For further particulars apply to the SECRETARY to the Medical School at the Royal London Ophthalmic Hospital, City Road, E.C.1; or to the Dean, Mr. CHARLES GOULDEN, O.B.E.

HOSPITAL for CONSUMPTION & DISEASES OF THE CHEST, Brompton

and SANATORIUM at FRIMLEY.

Students and qualified men are admitted to the practice of the Hospital and the lectures on payment of a Fee of One Guinea for One Month; Two Guineas for Three Months. Clinical Assistants to the Out-patients' Department are appointed for Six Months, and are expected to join the practice of the Hospital for that period. The Hospital practice includes out-patient and in-patient clinics, demonstrations in the Clinical Laboratory, Museum, Special Departments, and Artificial Pneumothorax.

Full particulars can be obtained from DR. MAURICE DAVIDSON, Dean.

THE ROYAL NATIONAL HOSPITAL

For CONSUMPTION AND DISEASES OF THE CHEST.

VENTNOR, ISLE OF WIGHT.

For those of moderate means, Open-air Treatment is afforded under the most advantageous conditions in the Undercliff of the Isle of Wight.

Terms 3 guineas a week; or 30/- a week with a governor's Letter of Recommendation.

Further particulars may be obtained from the Secretary;

R. N. H. C., 18, Buckingham Street, Strand, W.C.2.

PLAISTOW HOSPITAL, LONDON, E.13.

INSTRUCTION IN FEVERS, Etc.

This Hospital is fully equipped for instruction in infectious diseases. It is recognized by the Universities of London, Cambridge, and Oxford, the Royal Colleges of Physicians and Surgeons, etc.

CLASSES FOR MEDICAL STUDENTS are held on Tuesdays and Fridays throughout the year, except in August and September. There is a morning class at 10.45 and an afternoon class at 2.15. Fee for a two months' course, three guineas; for a three months' course, four guineas. In the event of there being smallpox cases at Dagenham Hospital during the Students' course, instruction in that disease will be included: qualified men can attend this course. Special arrangements made for D.P.H. students.

Enquiries and applications to join above Courses should be addressed to Dr. MacIntyre, Medical Superintendent, Plaistow Hospital, E.13. The Superintendent can also be seen at the Hospital on week-days at 2 p.m.

The Hospital is situated near Upton Park Station, to which frequent trains run on the District and Midland Railways.

THE HOSPITAL FOR SICK CHILDREN

GREAT ORMOND STREET, W.C.1

Clinical Instruction is given daily by Members of the Visiting Staff in the Wards, Out-patient Department, Operating Theatre, and Post-mortem Room.

Clinical Clerkships and Dresserships in the Wards and Clinical Assistantships in the Out-patient Department are also available for Post-Graduates, both men and women. Two months of the time spent as Clerks or Dressers by Undergraduate Students is recognized by the Universities of London, Oxford, Cambridge, etc., and by the conjoint Examination Board of England for their final examinations.

Fees for Hospital Attendances: One Month's Ticket, £2 2s. Three Months' Ticket, £5 5s. Perpetual Ticket, £10 10s.

Special Reduced Fee for Clinical Clerks, £1 1s. per month.

Further particulars may be obtained from the Secretary or the Dean.

WILFRED J. PEARSON, D.M., *Dean of the Medical School.*

Royal College of Surgeons in Ireland

SCHOOLS OF SURGERY.

WINTER SESSION commences in OCTOBER and SUMMER SESSION in APRIL.

PROFESSORS—*Anatomy*—EVELYN J. EVATT. *Physiology and Histology*—V. M. SYNGE. *Surgery*—A. A. MCCONNELL. *Chemistry*—WM. CALDWELL. *Physics*—WM. CALDWELL. *Practice of Medicine*—GEO. A. NESBITT. *Materia Medica, Therapeutics, and Pharmacy*—L. ABRAHAMSON. *Midwifery and Gynaecology*—A. H. DAVIDSON. *Forensic Medicine*—V. M. SYNGE. *Biology, Botany, and Zoology*—R. F. J. HENRY. *Ophthalmic and Anal Surgery*—Vacant. *Dentistry*—Vacant. *Pathology*—WM. BOXWELL.

PRIZES—The Barker Anatomical Prize, £26 5s. The Carmichael Scholarship, £15. The Mayne Scholarship, £5. The Gold and Silver Medals in Surgery, and the Stoney Memorial Gold Medal in Anatomy.

Class Prizes, accompanied by Silver Medals, will also be given in each subject.

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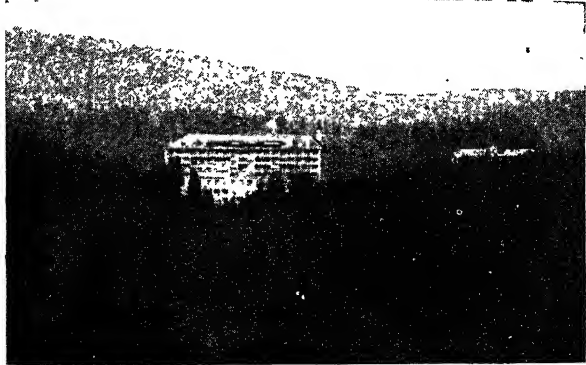
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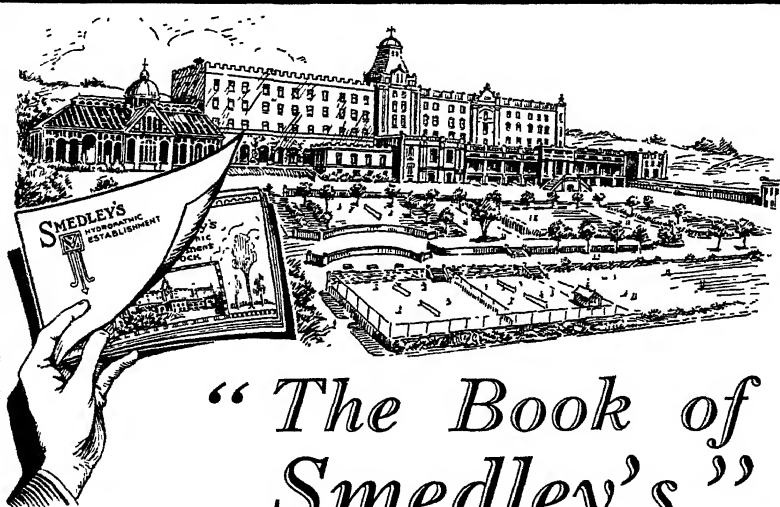
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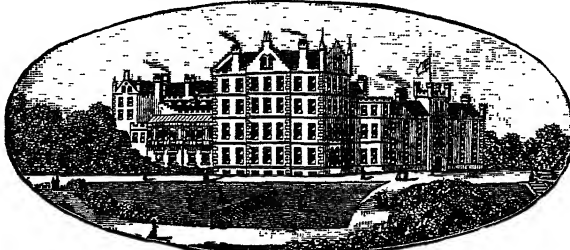
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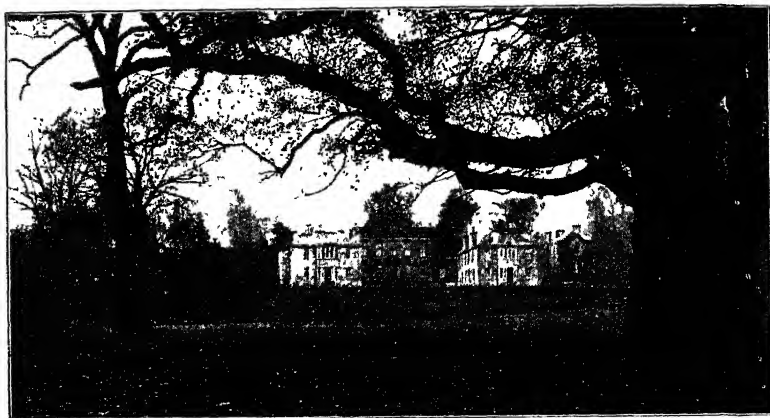
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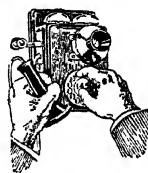
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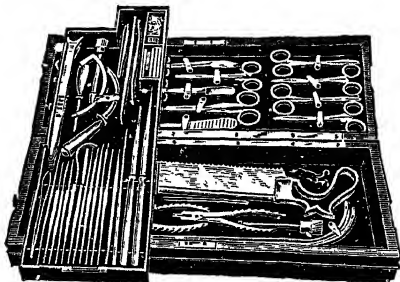
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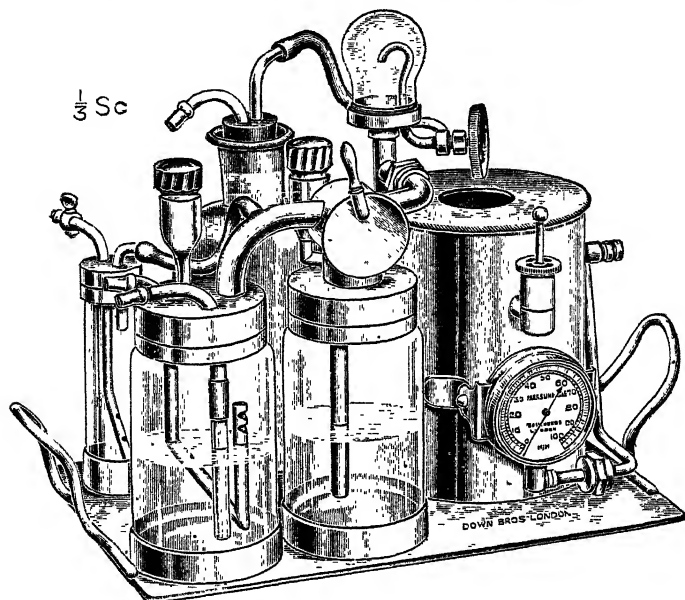
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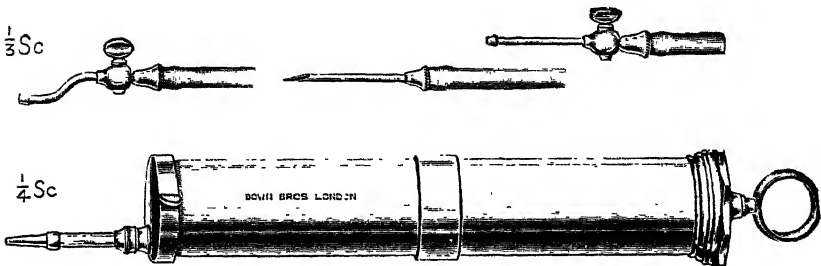
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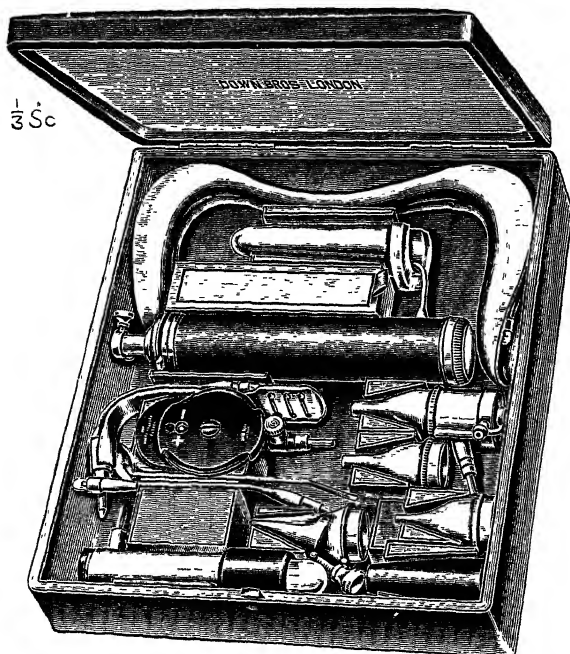
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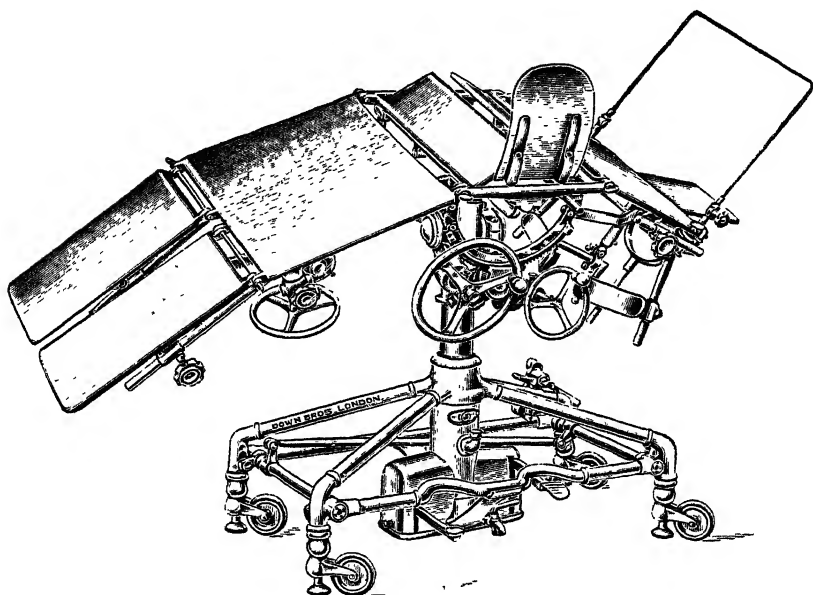
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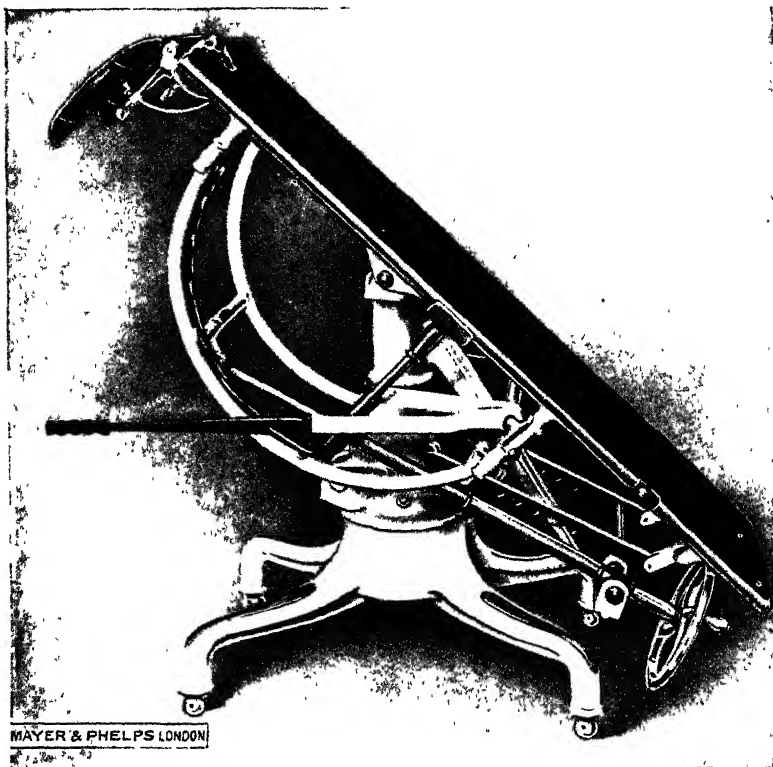


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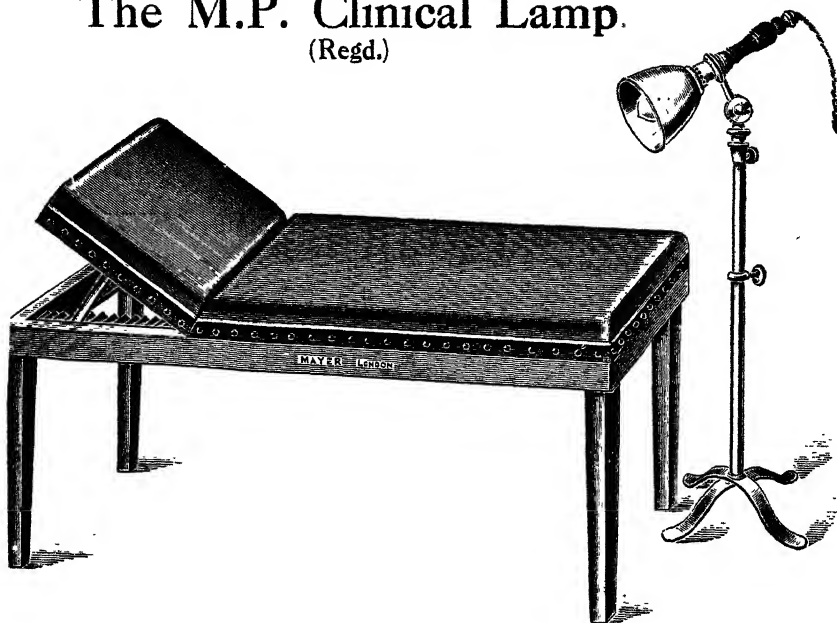
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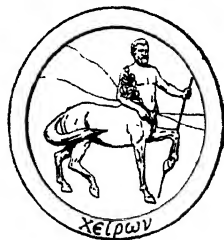
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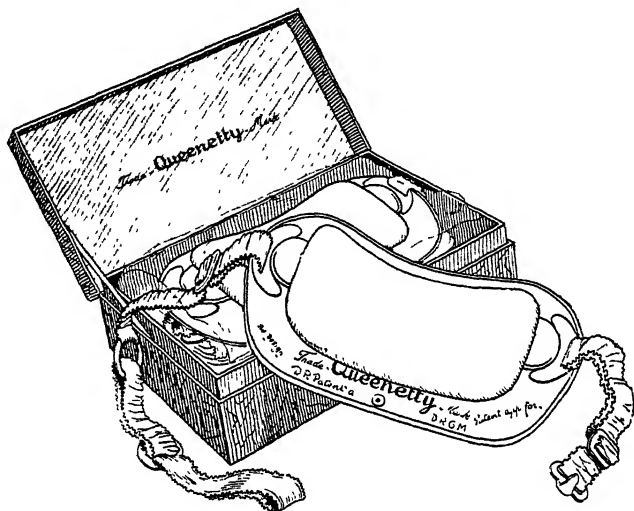
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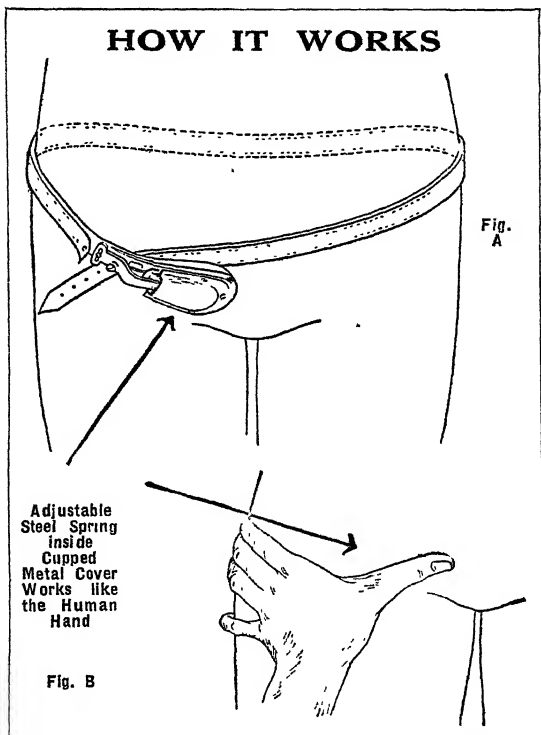
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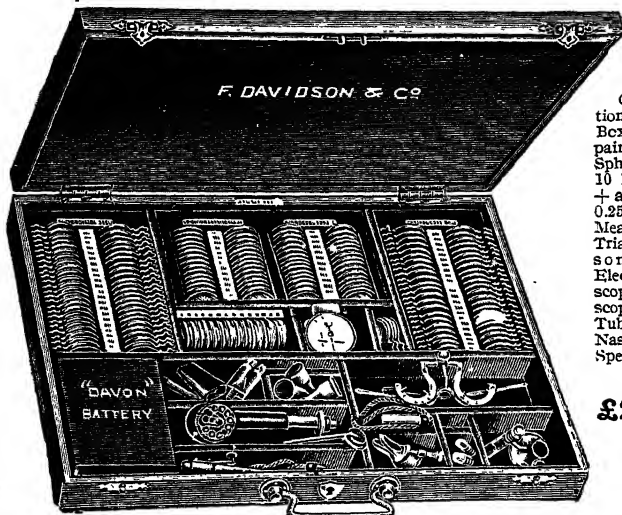
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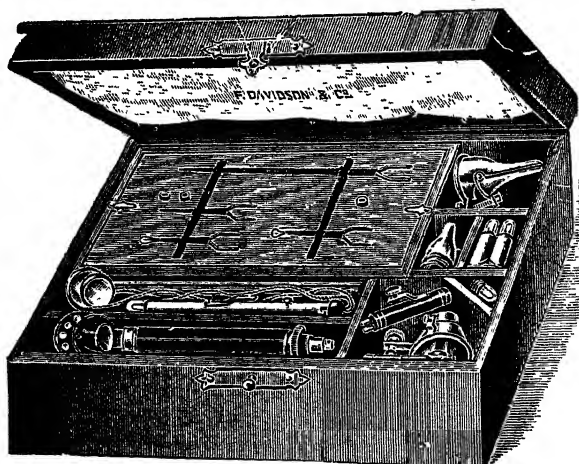
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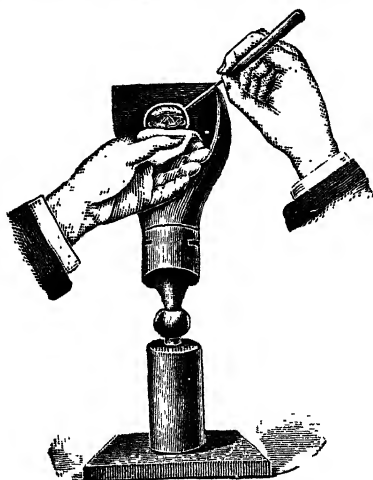
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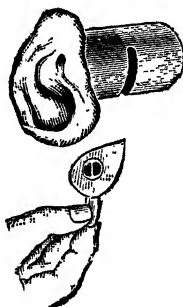
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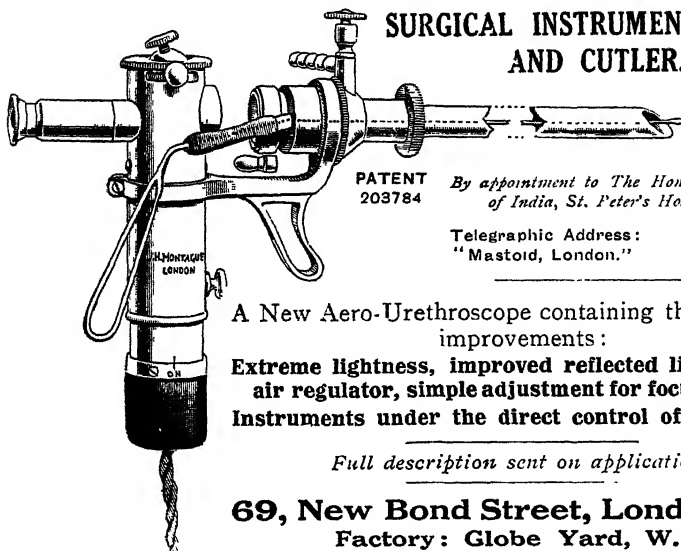
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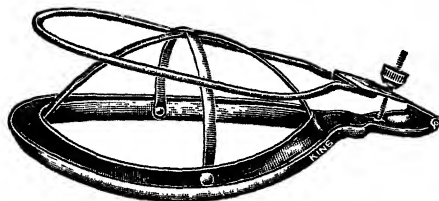
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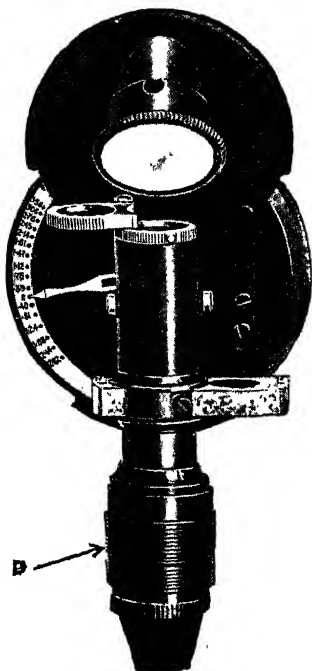
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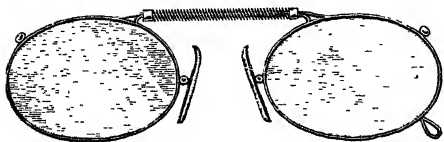
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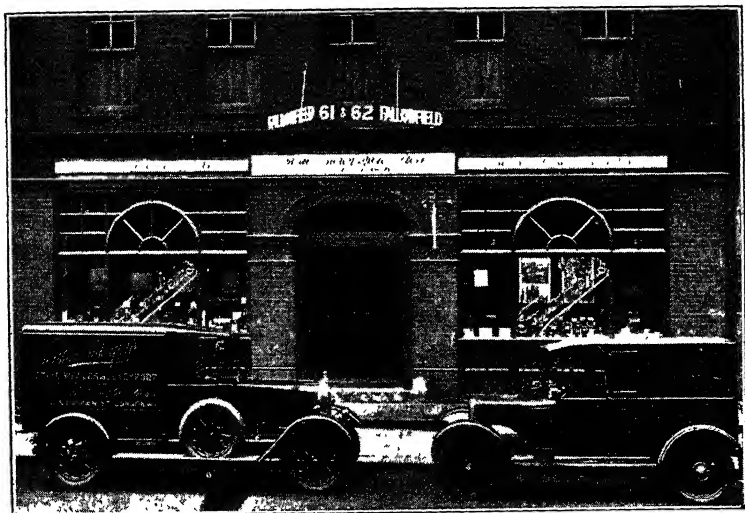
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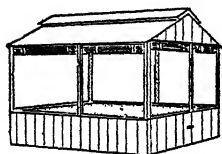
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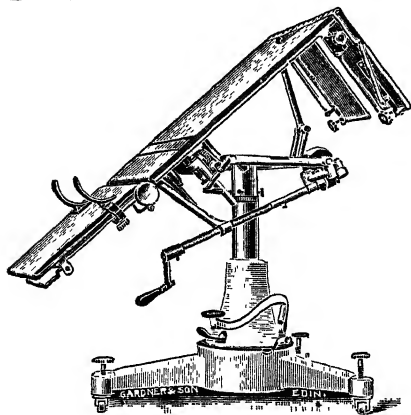
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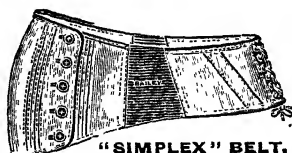
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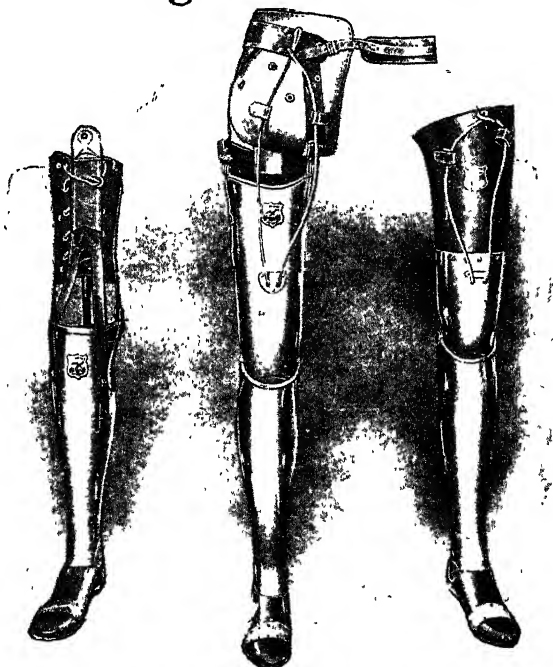
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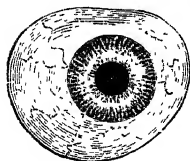
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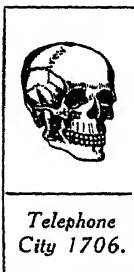
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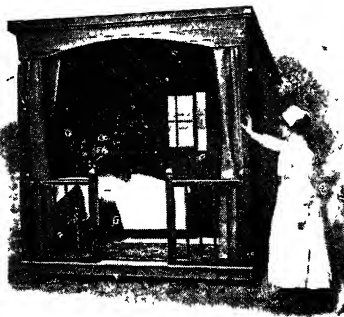
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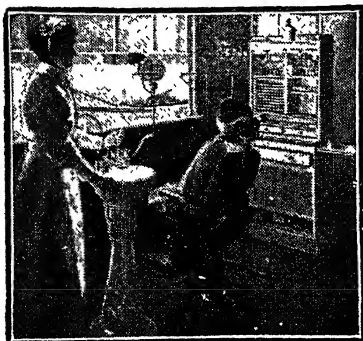
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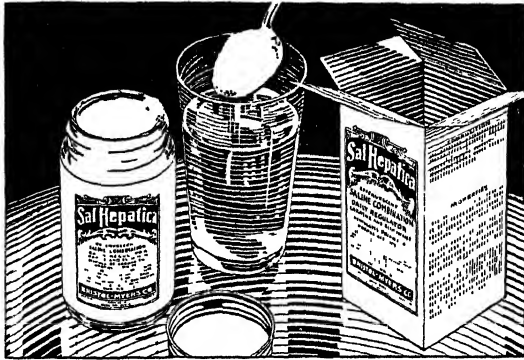
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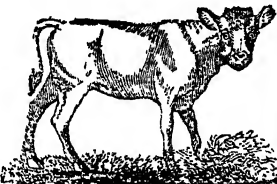
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